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The Soil Conservation Service Responds to the 1993 Midwest Floods

Steven Phillips



Cover photo: Ross Braun, Emergency Operations Center Coordinator for Missouri's flood recovery effort, stands amidst badly scoured cropland in Howard County. Photo by Norm Klopfenstein, SCS-Missouri.

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The Soil Conservation Service Responds to the 1993 Midwest Floods

Steven Phillips

**United States Department of Agriculture
Soil Conservation Service
Economics and Social Sciences Division
Washington, D.C. 20013**

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Foreword

This project began in August of 1994 with the support of National Historian Douglas Helms, Assistant Chief for the Midwest John Peterson, and the Assistant Directors of the Watershed Projects Division, Tom Wehri and Karl Otte. All four were eager to record the Soil Conservation Service's (SCS) flood recovery efforts as they happened in the Midwest and in Washington. This work is also part of a long-term project to chronicle the Service's experience in the field of water resources management.

Besides extensive access to the Service's reports on flood recovery activity, drafts of policy papers, and other documents, I benefited from interviews with many top staff involved in the Midwest effort. I sat in on many of the meetings over topics such as levee repair and wetlands easements. Other important sources included press reports from the Midwest, publications about the flood by other government agencies, the *Congressional Record* and Capitol Hill hearings, and White House press releases.

I made five visits to the Midwest to gather data on the Service's Emergency Watershed Protection program. All together, over fifty people were kind enough to take time out of their busy schedules to talk with me about their efforts. While a small degree of suspicion toward someone from Washington asking questions about progress and problems in their work was natural, almost without exception SCS employees were helpful in providing information. Many were acutely conscious of the historical significance of the flood and their recovery efforts, and were eager to see these developments recorded for posterity.

I want to thank SCS National Historian Douglas Helms for supporting this project. The original idea for this work was his. He helped create interest in the history among top SCS staff and arranged for funding. Perhaps most important was his assistance in the actual research and writing. Based on his experience and contacts in SCS and the field of agricultural history, Douglas Helms provided vital guidance to my work. He read and commented on various drafts, and brought to this work a consistency and coherence it would not have had otherwise. Others in the Economics and Social Sciences Division made contributions to this work: J. D. Ross provided the charts and graphs, Jennifer Harr and Leigh Ann Mayes proof-read this document, and Sheree Gross assisted with the selection of photographs. Stacey Wood, Glenn Lawson, and Lane Price of the Resources Inventory and Geographic Information System Division produced the maps used in this volume. Two other readers, Flora Faye Helms Griffin and Jane Kramer, provided valuable comments on matters of readability and style.

Introduction

For many reasons, the 1993 Midwest flood proved unique to both its victims and the Soil Conservation Service (SCS). First, highly unusual meteorological conditions caused the greatest deluge of water ever recorded in this region. In July, many parts of the Midwest were devastated by rain more than four hundred percent above normal. Second, this disaster lasted months; recovery will take years. For example, Cape Girardeau in southeastern Missouri was at flood stage almost every day between early April and early August. As late as mid-November, heavy rains brought yet another round of flooding to central Missouri and, in many areas, standing water remained even into the winter. In early April of 1994, flooding hit an area stretching from Oklahoma to Indiana. The third defining characteristic of the flood was the large area affected--nine important agricultural states stretching from the Canadian border to the confluence of the Ohio and Mississippi rivers in southeastern Missouri.¹ Fourth, the time and resources SCS devoted to recovery efforts far exceeded any previous emergency response. Congress allocated \$60 million to the Service in August of 1993, and another \$340 million in March of 1994 for flood recovery and related work. Through its Emergency Watershed Protection (EWP) program, SCS used these funds to assist communities in the Midwest. The Service's flood recovery work is expected to last well into 1995. Finally, the flood brought to a head many long-running debates over flood control and floodplain management policies. In this political environment, SCS attempted to satisfy the often conflicting demands of commercial agricultural interests and increasingly powerful environmental groups. This situation was further complicated by the arrival of a new presidential administration, its attempt to reorganize the USDA, long-term interagency rivalries, and budgetary pressures.²

Several other phenomena become clear when examining the progress of repair work and the development of flood recovery policies by the Service. Coordinating the political and policy struggles of SCS at the national level with field-level flood recovery activity was difficult at times. Most of those in the Midwest inside and outside of the government focused on restoring the economic health of the region by returning the floodplains and the structures which protect them to pre-flood conditions. At the same time, the deluge of 1993 led to a re-evaluation of floodplain management policies in the

¹ These states are Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin. Kentucky and Indiana also suffered some relatively minor flood damage.

² This attempt to improve the organizational structure of the federal government was commonly known as "Re-invention." Vice-President Albert Gore led this effort.



Flooding in the Red Rock Dam area along Iowa's Des Moines River. Photo by Ken Hammond, USDA.

United States. Many long-running SCS activities, such as the Small Watershed Program, were scrutinized by experts in the bureaucracy, academia, and media. The flood thus led to a major reassessment of policies, but may bring about major changes in the floodplain only after another huge flood wipes out the structures rebuilt in late 1993 and 1994. Another important issue was the great variation in flood damages and recovery work throughout the region. These differences were based on factors both physical--like geography or meteorology, and human--such as the goals and approaches of individual SCS state conservationists or field level employees. If one measures success in flood recovery by the consistency and uniformity of SCS efforts--focusing on the *process* of performing the work--the Service may come up short. If, on the other hand, one concentrates on the *results*, the numbers of projects completed which met the needs of local communities in the Midwest, SCS staff has reason to feel proud.

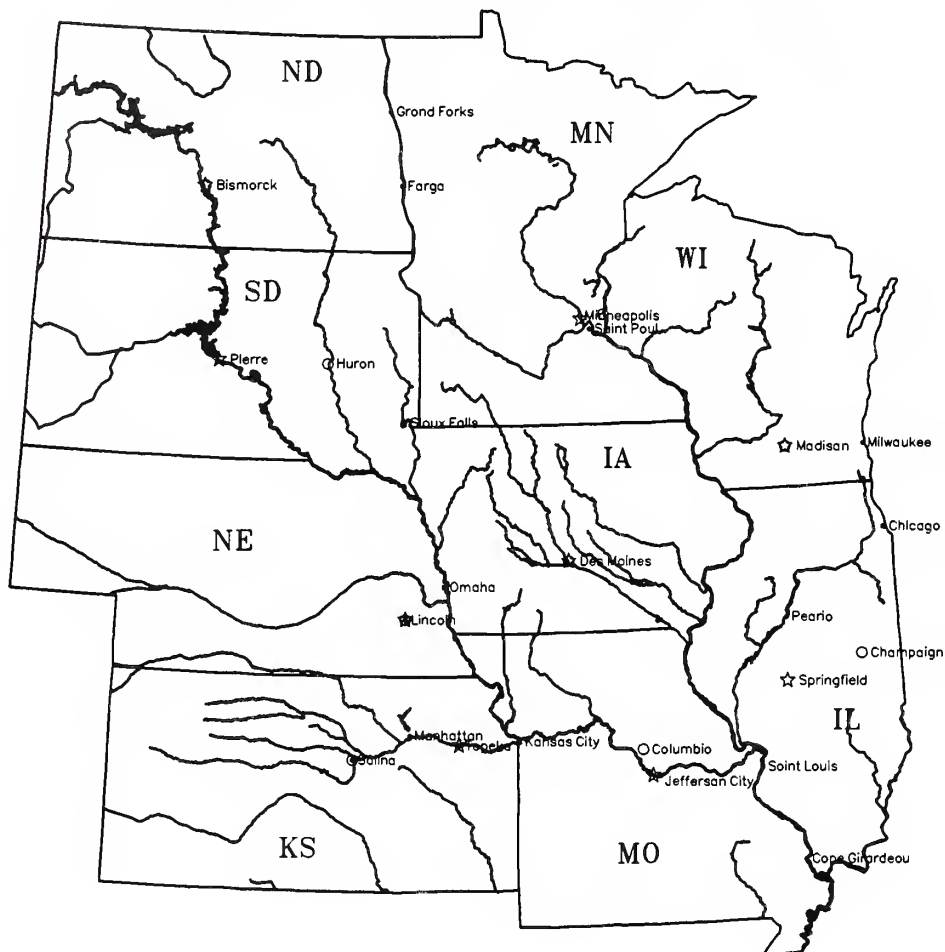
The goal of this study is not simply to chronicle recent history or revel in SCS's success, but rather to assist in program management by pointing out problems, both recurring and unique to 1993, which hamper an effective response to natural disasters. Starting from a historical summary of flooding on the upper Mississippi and lower Missouri rivers, it then describes 1993's disaster. Next, the general approach of the White House and

Congress to flood recovery is examined. The activities of individual U. S. Department of Agriculture (USDA) agencies also receive attention. Most of this document focuses on the Soil Conservation Service's flood recovery program, new wetlands and levee policies, and the vexing problems encountered in this work. A fascinating part of this story is how SCS, an agency which had built very few levees, ended up repairing many of them. Finally, the Service's work in each of the nine flood states will be discussed in detail.

U. S. Department of Agriculture

Soil Conservation Service

States Affected by the 1993 Flood



- ☆ State Capitol
- SCS State Office
- Major City

Scale 1:20,000,000

Map generated by the National GIS Applications Lab,
Washington, D.C., August 1994

Map ID: SAW.949

Map ID: SAW.949

Historical Background

Human habitation, agriculture, and water control structures have existed in the Mississippi and Missouri regions for millennia. The archaeological record shows that Native Americans inhabited the lower Missouri River basin as early as ten thousand years ago.³ Recent literature on the pre-Colombian period forms part of a great debate among experts over the impact of Native Americans upon the natural environment. Some scholars have attacked what they deem the "pristine myth" of Native Americans in perfect harmony with a natural environment unchanged by human activity.⁴ One example of Native Americans modifying their natural environment was Cahokia, which was a city near today's East St. Louis. It supported 30,000 people. Huge projects in that area also included agricultural landforms, settlements, causeways, and ritual mounds. The largest remaining mound is 30.5 meters high and covers 6.9 hectares (about seventeen acres).⁵ This is not to suggest that Native Americans built structures on the same scale or caused the same types or scope of environmental degradation as the European immigrants did, but rather to emphasize that the drive to control and use these waters was a long-term one that cuts across cultural boundaries.

Upper Mississippi River

Besides the rich archeological record, written materials also discuss life on the Mississippi and document the presence of massive floods. Annals of the ill-fated attempt by Spaniard Ferdinand De Soto to explore the Mississippi River region from the mouth of the Arkansas River southward provide evidence of Indian settlements along the river. Ironically, these explorers welcomed a large flood. The remaining 350 of De Soto's men (of the original one thousand in his expedition) were protected in 1543 due to a flood that separated them from their Native-American attackers.⁶ The water was out of its banks for eighty days between March and May of that year. Overall, the Spanish were a sporadic presence in the Mississippi valley. They focused on trade, not settlement, and did nothing to develop water control structures.

³ Henry Hart, *The Dark Missouri* (Madison: The University of Wisconsin Press, 1957), 25.

⁴ See Karl W. Butzer, "The Americas before and after 1492: An Introduction to Current Geographical Research," and William M. Denevan, "The Pristine Myth: The Landscape of the Americas in 1492," both in *Annals of the Association of American Geographers* 82, 3 (1992): 345-368 and 369-385 respectively.

⁵ William Doolittle, "Agriculture in North America on the Eve of Contact: A Reassessment," *Annals* 82, 3 (1992): 386-401. Even these structures were minor compared to the massive public works projects of the central Mexican and Andean civilizations.

⁶ John W. Monette, *History of the Discovery and Settlement of the Valley of the Mississippi* (New York: Harper & Brothers Publishers, 1946), 58-61.

By the late 1600's, the French had moved into the Great Lakes region and had begun to explore the upper reaches of the Mississippi. By 1699, they realized that the river they had explored in the north emptied into the Gulf of Mexico. After Napoleon Bonaparte's victory over the Spanish, the French also took control of the land that would become New Orleans. Levee construction began in the early 1700's around this vital trading center near the mouth of the Mississippi River. By 1735 approximately forty-two miles had been completed below and above the city. In order to promote flood control, the French declared in 1743 that any land not protected by levees by the next year would be claimed by the Crown. From this humble beginning, flood control efforts generally spread northward, following the development of sizable towns and infrastructure in the major river bottoms.

While these events set precedents in levee building and helped develop the lower Mississippi, President Thomas Jefferson's Louisiana Purchase of 1803 was the single most important step toward opening the Mississippi and Missouri regions to permanent, non-Native American, settlement. Migrants, mainly farmers, pressed westward by land. The marriage of agricultural commodities and inexpensive river transport quickly made this region vital for the young Republic's economic development. By the late 1800's, the upper Mississippi also had become an important waterway for lumber, grain, and other commodities.⁷ The river has played a role not only in the nation's economic life, but also in its cultural development, as shown by the works of Samuel Clemens (Mark Twain).⁸

As settlements grew into towns, then into cities, concerns over flooding grew and the construction of levees increased. The more developed and populated lower Mississippi continued to be the focus of most attention. The Swamp Acts of 1849 and 1850 represented the Congress' first attempt to enable the individual states of the lower Mississippi to undertake flood control. The Acts granted swamp and overflow lands to the states. The land then could be sold to finance drainage or flood control projects. The program achieved relatively little due to the lack of coordination across state lines and the enormity of the task it confronted. Massive floods in 1858 led to a turning point in the development of flood control strategies. This can be seen clearly in an 1861 report by Army Corps of Engineers' Captain A. A. Humphreys and Lieutenant Henry L. Abbot. Their rejection of reservoirs, cutoffs, and outlets led to what has been deemed the "levees only" policy of the Corps.⁹ The Corps (sometimes abbreviated as COE) moved

⁷ For a history of navigation and flood control on the Upper Mississippi, see Ronald Tweet, *A History of the Rock Island District, Corps of Engineers* (Washington: U.S. Government Printing Office, 1975).

⁸ As one essayist writes, "One might say, paraphrasing Herodotus, that American literature is a gift of the Mississippi." Andrei Codrescu, "Down in the Flood," *Sierra* (March-April 1994): 85-86.

⁹ *The Mississippi River: A Short Historic Description of the Development of Flood Control and Navigation on the Mississippi River* (Vicksburg: Office of the President, Mississippi River Commission, 1940), 16.

away from this singular focus on levees by the early 1900's. The legacy of this policy was the Corps' alleged over-emphasis upon flood control structures, of which levees were among the most visible. This became a key point of contention in the aftermath of the 1993 flood.

It was not until 1866 that Congress authorized funds for navigational improvements on the upper Mississippi. The next major step in flood control was the creation of the Mississippi River Commission by Congress in 1879. Congress charged the Commission with improving navigation and flood control under the leadership of the Corps. The bulk of this work occurred in the area south of Cairo, Illinois, but did go as far north as Keokuk, Iowa. Focusing on structural measures, the extent and size of levees increased steadily. In 1895 the Corps of Engineers began its first flood control project in the area, the Flint Creek Levee. Before this time, local communities constructed and maintained their own levees. For example, one of the largest projects was in the Sny Drainage District in southern Illinois. The district built a fifty-mile levee in the late 1800's. Much of the responsibility for flood control structures on the upper Mississippi and its tributaries was and remains in the hands of private citizens or local government. This lack of central authority was an important issue after the 1993 flood and received a great deal of attention from those discussing the future of floodplain management policies.¹⁰

While flood control efforts have expanded gradually due to increasing population and infrastructure in the floodplain, large floods have been the vital catalysts for significant increases in financial and legislative support from the federal government. Major developments in Mississippi River flood control, however, remained focused on the lower reaches. As a result of the devastating floods of 1927, which overtopped many levees, Congress passed the Flood Control Act of 1928 which authorized structural work, including levees, from Cape Girardeau, Missouri, southward to the Gulf of Mexico.¹¹ The Army Corps of Engineers had designed and built structures, and had enforced standards for flood control structures in this region. The next step was the Flood Control Act of 1936, which clearly stated that flood control was a federal responsibility. Perhaps most importantly, the 1936 law connected smaller local projects in the upstream tributaries with the task of flood control along the major rivers. The key requirement for these projects was that benefits exceed costs.¹²

¹⁰ The one field where the Corps has had the most authority has been in the creation and maintenance of navigable channels on America's major rivers.

¹¹ This flood inundated about eighteen thousand square miles of territory in the Lower Mississippi.

¹² Luna B. Leopold and Thomas Maddock, Jr., *The Flood Control Controversy: Big Dams, Little Dams, and Land Management* (New York: The Ronald Company, 1954), 101-102.

The focus of flood control work gradually shifted to the Ohio, Missouri, Arkansas-White-Red and upper Mississippi basins in the 1960's.¹³ Much of the structural work centered on the construction of dams and reservoirs on tributaries to the Mississippi, such as the Cedar River, Des Moines River, and the Grand River.¹⁴ In 1962 Congress attempted to coordinate flood control efforts by authorizing what became only one of many commissions, committees, or interagency studies--the Upper Mississippi River Comprehensive Basin Study. This project, led by the Corps of Engineers in consultation with other federal agencies and individual states, was completed in 1972. Historically, the problem this and other groups have faced has not been developing rational, long-term solutions to floodplain management problems. Instead, change has been stymied by the lack of political support that could be translated into legislative and financial backing.

It is important to remember that, on the upper Mississippi, more than in the lower reaches, flood control did and does reflect a mixture of local, state, and federal efforts. Most levees remain in private or local government hands. Further, there has been a strong emphasis on upstream land treatment for flood prevention, an area of particular SCS expertise, in the upper Mississippi region.¹⁵ For these reasons, the Corps has been much less powerful as a centralizing force in the upper Mississippi than it has been downstream.

The most common floods in the upper Mississippi result from snow melt and rainfall in the spring of each year. These are not sudden floods, but rather gradual and steady rises in the water level.¹⁶ Just as the 1993 event proved to be unusual, however, the largest floods in the past were more than simply expanded versions of the common annual events. Major floods occurred in 1951, 1965, 1969, and 1973. The 1951 event hit in late April and early May due to exceptionally warm weather in March which led to fast snowmelt upstream, as well as six major storms. The Corps credited its flood control works with limiting damage. Only about five thousand people required evacuation. The 1965 flood was caused almost exclusively by snowmelt. The ground was wet when the winter freeze occurred in late 1964, thus preventing any water from soaking into the soil. Then, above-average snowfall hit the upstream areas of the Mississippi. This flood,

¹³ Beatrice Holmes, *History of Federal Water Resources Programs and Policies, 1961-1970*, U.S. Department of Agriculture, Economic, Statistics, and Cooperative Service, Misc. Pub. No. 1379 (Washington: U.S. Government Printing Office, 1979), 9.

¹⁴ Ellis L. Armstrong, ed., *History of Public Works in the United States, 1776-1976* (Chicago: American Public Works Association, 1976), 259.

¹⁵ See the section on SCS and the Emergency Watershed Protection program, as well as state sections, for more detail on the Service's work in this area.

¹⁶ A study of another kind of disaster, flash floods caused by sudden storms in Iowa, showed that June was the most dangerous month. These floods, although severe, covered a relatively small area (a few counties) for a limited duration. Harlan H. Schwob, "Floods in Iowa," in Merwin D. Dougal, ed., *Flood Plain Management: Iowa's Experience* (Ames: The Iowa State University Press, 1969).

lasting from early April through mid-May, was greater than in 1951. Another event was the April flood of 1969, which devastated South Dakota, Minnesota, Wisconsin, Illinois, and Iowa, caused \$147 million in damages, and took eleven lives. In many areas, the recurrence levels exceeded that of a fifty-year flood. This disaster was the result of heavy rains in the fall of 1968 and blizzards in early 1969. In fact, March and April rainfall in the region was below normal; this event was almost solely the result of previous precipitation. The 1973 flood was caused by rain, not snowmelt. Rainfall over much of the Midwest was two hundred and twenty percent above normal for the first six months of 1973. Hannibal, Missouri, was at flood stage for one hundred days in the spring and early summer. About one hundred and eighty thousand acres were inundated.¹⁷ These were the floods for which the people of the upper Mississippi and its tributaries had prepared. Each of these events was smaller than the 1993 flood.

Lower Missouri River

European or American exploration, settlement, and control of the Missouri River occurred slightly later than on the Mississippi. In 1673, French explorers Father Jacques Marquette and Louis Joliet traveled down the Mississippi to its confluence with the Missouri. They later wrote:

As we were gently sailing down the still clear water (of the Mississippi River), we heard a noise of the rapid into which we were about to fall. I have seen nothing more frightful, a mass of large trees entire with branches...We could not without great danger expose ourselves to pass across...The water was all muddy, and could not get clear.¹⁸

This description raised an important distinction between the Mississippi and Missouri rivers. The latter flows through loessial soils of the central United States, constantly eroding and carrying these soils into the lower Mississippi. The Missouri River is nicknamed the "Big Muddy" due to its chocolate brown color--it carries up to five times as much sediment as the Mississippi River north of Cairo, Illinois.

¹⁷ Tweet, *A History of the Rock Island District*, chapter IX, "Flood Control."

¹⁸ Quoted in Frances Cushman and Gordon MacGregor, *Harnessing the Big Muddy: The Story of the Missouri River Basin* (The United States Indian Service, 1948), 33.

The first non-Native Americans to see the source of the Missouri were members of the expedition led by Meriwether Lewis and William Clark, who traveled up the river from St. Louis in 1804-1806. For much of the nineteenth century, people passed through the Missouri region and settled farther west in California. By the late-1800's, however, the region began to "fill-in" with growing agricultural settlements.¹⁹

Flood control followed roughly the same pattern as on the upper Mississippi River, although at a later date.²⁰ Congress created the Missouri River Commission in 1884. The Commission focused on "bank protection and similar construction."²¹ It did little of lasting importance and its work was hampered by a lack of funds and the fact that political and economic interests focused on local protection of structures on the banks rather than on developing a navigable channel.²² The Commission existed until 1902, when the Corps of Engineers took responsibility for the region. As mentioned earlier, after the great flood of 1927 on the lower Mississippi River, Congress passed the Flood Control Act of 1928, which charged the Corps with investigating and planning for all major tributaries. Only then did the Corps begin significant flood control work in the Missouri River basin. The Corps of Engineers became particularly active in the 1950's through the Pick-Sloan Plan.²³ This program grew from separate investigations by the Corps and the Bureau of Reclamation authorized by the 1936 Flood Control Act and later combined in the 1944 Flood Control Act. The Corps constructed a series of reservoirs stretching from Missouri to Montana. In 1972, the work of coordinating flood control efforts was placed in the hands of the Missouri River Basin Commission.²⁴ Overall, the Missouri River, like the Mississippi, has been manipulated and governed by a wide variety of federal, state and local governments, as well as through the efforts of levee districts and individual landowners along the river.

¹⁹ For a detailed account of settlement in the Missouri Basin, see Hart, *The Dark Missouri*, Chapter III, "The Planned Frontier."

²⁰ For an interesting and comprehensive overview of man's effect upon the Lower Missouri River, see John L. Funk and John W. Robinson, *Changes in the Channel of the Lower Missouri River and Effect on Fish and Wildlife*, (Jefferson City: Missouri Department of Conservation, 1974).

²¹ O. V. P. Stout, "The Relation of Power and Irrigation at the Headwaters of the Missouri to Floods in the Lower Courses of the River," in *The Control, Development, and Utilization of the Missouri River and Its Tributaries: Report of a Symposium Held at the State University (Nebraska)*, May 20, 1908.

²² Hart, *The Dark Missouri*, 82.

²³ Flood control in the Midwest, especially Kansas, has been an important part of the "big dam-little dam" debate. For an outline of the debate, see Douglas Helms, "Small Watersheds and the USDA: Legacy of the Flood Control Act of 1936," in *Readings in the History of the Soil Conservation Service*, Historical Notes No. 1 (Washington: Soil Conservation Service, 1992), 96-109.

²⁴ For more historical information concerning debates over flood control on the Missouri, see Richard G. Baumhoff, *The Damned Missouri Valley: One Sixth of Our Nation* (New York: Alfred A. Knopf, 1951).

Rufus Terral, in his history of the Missouri Valley, describes two types of "normal" flooding on this river.²⁵ First are the brief floods due to the rapid melting of snow on the Great Plains in March and April. Second is the "June rise" when snow in the mountains melts and heavy rains hit the lower basin. The worst floods appear when these two crests occur simultaneously. No previous floods caused the destruction nature wrought in 1993. One of the longest floods was in 1915. It lasted two and a half months. One of the most extensive floods was in 1943. It covered 2.26 million acres of Missouri River bottom lands, which was less than the area flooded in the state of Missouri alone in 1993.

One major flood was the 1951 event in Kansas and Missouri. As in 1993, heavy rains over an extended period of time were the chief cause. Greater than average precipitation fell in May, June and early July. Then on July 10, the heaviest rainfall since 1844 hit, dumping up to fifteen inches of rain in two days. Fifteen people died and property damage was estimated to be over one billion dollars. The actual time during which towns or farms were inundated, however, was only a few days. Foreshadowing 1993, the problems of scouring (topsoil being removed by rushing water) and sand deposits were prevalent along the Missouri River. Also, a USDA publication admitted that its work in straightening and improving channels sped up the water and increased flood crests.²⁶ This became an extremely contentious environmental issue in the 1960's and after.

Another large flood resulted from rains around Kansas City on September 12 and 13, 1977. The same weather pattern which produced between ten and sixteen inches of rain over two days in 1977 would reappear and remain over the Midwest for months in 1993. While a low pressure system was centered over Kansas, warm, moist air from the Gulf of Mexico pushed northward. The resulting precipitation led to stream flows greater than those estimated for a one hundred-year flood.²⁷ In 1977, the disaster affected only ten counties around Kansas City, yet twenty-five people died and the area suffered over \$80 million in damages.

²⁵ Rufus Terral, *The Missouri Valley: Land of Drought, Flood, and Promise* (New Haven: Yale University Press, 1947), 84.

²⁶ *The Great Flood*, Agriculture Information Bulletin No. 81 (Washington: U.S. Government Printing Office, 1952).

²⁷ For further details on this flood, see Leland D. Hauth and William J. Carswell, Jr. and Edwin H. Chin, *Floods in Kansas City, Missouri and Kansas, September 12-13, 1977*, U.S. Geological Survey and National Oceanic and Atmospheric Administration, Geological Survey Professional Paper P1169 (Washington: U.S. Government Printing Office, 1981).

The deluge of 1993 and SCS's response must be considered in the context of these previous floods and the resulting flood control efforts. Over the past one hundred years, a variety of federal, state, local, and private entities have built flood control structures on the upper Mississippi, the lower Missouri, and their tributaries. Usually, modifications to America's flood control policies were direct and immediate responses to major floods. While experts, advocates, and visionaries have called consistently for new approaches, the vital political and economic backing for change came only after large disasters. Unlike the lower Mississippi, Congress never authorized a single agency to enforce a unified system of floodplain management on the upper Mississippi and lower Missouri. Nevertheless, the region was prepared for the "regular" spring floods and had endured and recovered from less frequent, but much larger events. The debacle of 1993, however, was beyond anyone's expectations.

An Unprecedented Flood Event

There are a variety of ways to illustrate the incredible rainfall, flooding, and damages suffered in 1993:

- Three National Weather Service (NWS) weather stations in the Midwest reported receiving over four hundred percent of the normal July rainfall.
- NWS stated that, in eight of the nine flood states, July of 1993 was among the three wettest months since complete records were first kept in 1895.²⁸
- This was the wettest June and July in history for Wisconsin, Iowa, and Illinois. Parts of Kansas and Missouri received 3.5 feet of rain between April and the end of July.²⁹
- At the four USGS stream flow gauging stations with the longest complete records, peak discharge exceeded that expected with a one hundred-year recurrence interval. The peak discharge at Van Meter, Iowa, along the Raccoon River, was twice as great as any measurement taken in the gauging station's eighty-year history.³⁰
- Over the course of the flood, fourteen rivers, including the Mississippi, Missouri, Illinois, Iowa, Minnesota, Des Moines, Rock, Raccoon, and Skunk, reached historic highs.
- SCS estimated that 12.8 million acres were flooded.

²⁸ Much of this weather data comes from Kenneth L. Wahl, et. al., *Precipitation in the Upper Mississippi River Basin, January 1 through July 31, 1993*, U.S. Geological Survey Circular 1120-B (Washington: U.S. Government Printing Office, 1993).

²⁹ One inch of rain over one acre equals 27,143 gallons of water.

³⁰ Charles Parrett, et. al., *Flood Discharges in the Upper Mississippi River Basin*, 1993, U.S. Geological Survey Circular 1120-A (Washington: U.S. Government Printing Office, 1993), 8. Perhaps the best explanation of a one hundred-year flood comes from a 1992 floodplain management report:

Probably the most misunderstood floodplain management term is the "100-year flood."...[T]he "100-year flood" is simply another term to refer to the one percent annual chance flood--the flood that has a one percent chance of being equaled or exceeded each year....Unfortunately, the term is often taken literally, with individuals believing that if they have experienced a "100-year" flood, another flood of that magnitude will not occur for another 100 years.

A one hundred-year flood is often called a "base flood." It becomes the standard which structures and flood control measures are built to contain. See chapter 9, "Perception, Awareness and Response," in *Floodplain Management in the United States: An Assessment Report, Volume 2: Full Report* (Federal Interagency Floodplain Management Task Force, 1992), 9-7.



Virgil Eichelberger inspects a center-pivot irrigation system on his farm in Muscatine County, Iowa. Photo by Ken Hammond, USDA.

- Due to rainfall and subsequent flooding, USDA's Economic Research Service lowered its 1993-4 national corn production estimate by eight percent (650 million bushels) and soybean estimate by three percent (seventy million bushels) in July.³¹ These figures proved optimistic. Based on November estimates, the Midwest flood and Southeast drought were blamed for a thirty-one percent drop in corn production and a sixteen percent drop in soybean production compared to 1992. Corn yields declined from 131.4 bushels per acre in 1992 to 103.1 bushels in 1993.
- The Midwest suffered \$12 billion in flood damages and forty-seven deaths.³²

³¹ It is important to remember that many upland areas away from the rivers suffered crop damage due to excess rainfall and saturated soil, not flooding. "Flooding in the Midwest Pushes Down Production Forecasts," July 19, 1993, Cooperative Extension Service (CES), available from IDEA Information Client through the Internet.

³² Richard Meryhew, "Nation's Pain May Be Flood Plain's Gain," *Star-Tribune* (Minneapolis), December 5, 1993. See also a news release from the American Red Cross, "Fact Sheet: Midwest Floods." Total damage estimates in the media ran from \$10 to \$20 billion. The \$12 billion figure was cited most frequently. For a brief overview of the economic consequences of the flood, see John Boyd, "Year Later, Flood Costs Continue to Climb," *Journal of Commerce*, June 27, 1994.

U. S. Department of Agriculture

Soil Conservation Service

Area Inundated



Source: Earth Resource Observation System Data Center

Scale 1:20,000,000

Map generated by the National GIS Applications Lab,
Washington, D.C., August 1994

Map ID: SAW.949

With the benefit of hindsight, the disaster of 1993 does not appear to have been a complete surprise. For example, on March 6, 1993, a report buried on page 6B of the *Minneapolis Star-Tribune* contained a warning by a NWS hydrologist that the potential for minor to moderate flooding existed in the region.³³ In the late summer of 1993, the United States Geological Survey (USGS) reported that "The areal extent and magnitude of the 1993 Mississippi River flood was due to a persistent wet-weather pattern that was throughout the upper Mid-western United States for at least six months preceding the flood."³⁴ The pattern was due to the position of the jetstream, which steadily drew warm moist air from the Gulf of Mexico northward, where it clashed with cooler air from Canada, thus resulting in heavy rainfall. While the upper Midwest sat under this convergence zone and was drenched, the East from Alabama to Vermont suffered from heat and drought.³⁵ The flood was limited to the area north of the confluence of the Ohio and Mississippi rivers due to abnormally low rainfall over the Ohio basin during the spring and summer. The National Oceanic and Atmospheric Administration (NOAA) reported that the persistent weather pattern over the United States set several different types of records in three regions: Midwest (wettest), Northwest (coldest), and Southeast (hottest and driest).³⁶

Many reasons were offered to explain the wet weather of 1993. The September issue of *Farm Journal* contained an interesting article on some possible reasons for the record-setting rain, including El Niño over the Pacific Ocean, the effects of the 1991 eruption of Mt. Pinatubo in the Philippines, greenhouse warming, lunar cycles, and sunspot cycles.³⁷ Scientists with the Greenland Ice Core Project, who investigate long-term temperature change by examining layers of ice thousands of years old, suggested that the 1990's marked the beginning of a period of large climatic shifts.³⁸ In late 1993, NOAA said

³³ For an excellent chronology of early flood predictions, see Robert Dvorchak, "The Life and Death of a Natural Disaster," *Columbia Missourian*, August 8, 1993. This article was part of a special insert in the newspaper which contained a great deal of information about the flood and damages in Missouri.

³⁴ Parrett, *Flood Discharges in the Upper Mississippi River Basin*, 1-3.

³⁵ The month of August was among the ten driest on record in Florida, Ohio, Maine, and Rhode Island.

³⁶ The month of August was among the ten coldest on record in Montana, Colorado, Idaho, and Utah.

³⁷ El Niño is a warm air current along the coast of Peru which develops in February or March of each year. It is a major factor in the weather of the West Coast. The Greenhouse Effect is based upon the controversial theory that carbon dioxide emissions from the burning of fossil fuels trap heat in the upper atmosphere, thus raising the earth's temperature and bringing about climatic change. Others claim that pollution in the upper atmosphere will in fact block the sun's rays and aid in cloud formation, thus lowering temperatures. The eruption of Mount Pinatubo in the Philippines is also part of this debate. It spewed forth tons of particles into the upper atmosphere. Further, some scientists believe that sunspot cycles (eleven years) or magnetic cycles (twenty-two years) have a measurable effect upon weather patterns.

³⁸ Charlene Finck, et. al., "Big Weather: Recovery from 1993's Disaster Could Take a Decade," *Farm Journal* (September 1993): 11-13.

that there was insufficient data to blame Mt. Pinatubo or greenhouse gases.³⁹ It did not address the other issues. In early 1994, NOAA stated that the ENSO (El Niño-Southern Oscillation) was a major culprit of the 1993 Midwest floods.⁴⁰ It spawned the weather pattern that dumped heavy rain week after week over the central United States.⁴¹

James A. Smith, in the newsletter of the National Research Council's Water Science and Technology Board, put the 1993 flood into the context of the convergence of several inter-related factors. First, global atmospheric conditions increased the number and severity of storms moving eastward across the central United States. Second, wet soil conditions in the spring of 1993 increased run-off into streams and rivers. Third, increased soil moisture actually may have affected weather patterns and led to more thunderstorms in the region. Thus, the heavy rainfall became almost self-perpetuating.⁴²

Whatever the cause, persistent rain, punctuated by a series of extremely powerful storms, wracked the upper Mississippi and lower Missouri river regions through the late spring and summer of 1993. In early June, heavy rain hit Minnesota, Iowa, North Dakota, and South Dakota. On June 17 and 18, between two and seven inches of rain fell in southern Minnesota, southwestern Wisconsin, and northern Iowa. Two major storms in early July were key to the floods in Iowa. On July 4 and 5, as much as five inches of rain fell in the central part of the state. On July 8 and 9 yet another eight inches fell in roughly the same area. Next, on July 15 and 16 two to seven inches of rain hit parts of North Dakota and Minnesota. Finally, the Missouri River, already at flood stage, flowed out of its banks in many areas due to a two- to thirteen-inch rainfall between July 22 and 24 across Nebraska, Kansas, Iowa, Missouri, and Illinois.

In mid-June, the national press took notice. The Associated Press reported that a "record wet spring in the Midwest is washing some of the nation's most productive soil into the Mississippi River and its tributaries."⁴³ By the end of the month, the Corps of Engineers had closed almost five hundred miles of the Mississippi River to traffic, covering an area from St. Paul, Minnesota, to Alton, Illinois.⁴⁴ On July 3, the Missouri River closed to barge and boat traffic. Along hundreds of miles of the Mississippi and Missouri rivers, highway bridges were closed, cutting vital transportation links and

³⁹ *Special Climate Summary 93/3*, September 14, 1993, National Weather Service, National Meteorological Center, Climate Analysis Center.

⁴⁰ Southern Oscillation indicates the changes in air pressure caused by El Niño.

⁴¹ "Pacific Ocean Warming a Major Cause of Floods," *The Bismark Tribune*, September 17, 1993.

⁴² James A. Smith, "Mississippi River Flooding of 1993: Lessons Learned," *WSTB* 11, no. 2 (April 1994): 1-2. WSTB stands for Water Science and Technology Board.

⁴³ Robert Greene, "Wet Spring Causes Erosion Along with Crop Delays," AP wire, June 19, 1993. Note: Many of the news reports cited in this history can be obtained in full from the "Ag-AM" press clipping file. These materials are held for six months at the NAL's Reference Room.

⁴⁴ "Hundreds of Miles of US Mississippi River Closed Due to Flooding," UPI wire, June 27, 1993.

preventing people from reaching their jobs.⁴⁵ Flood conditions would continue to worsen through August.⁴⁶ In July and August, it was as though a sixth Great Lake, centered around northern Iowa, had sprung up in the Midwest.

It was not just the amount, but also the content of the water that brought danger to the people of the Midwest and their neighbors in the lower Mississippi and the Gulf of Mexico. The flood waters carried pesticides, fertilizers, and all manner of debris downstream. A USGS expert stated that "We thought that concentrations [of agricultural chemicals] would be diluted by the record-high flows, but this did not turn out to be the case."⁴⁷ In fact, the total atrazine (an herbicide) load carried into the Gulf of Mexico between April and August of 1993 was 235 percent greater than during the same period in 1992 and eighty percent over the 1991 figure. The total nitrate load was 112 percent higher than 1992, and thirty-seven percent greater than in 1991. USGS also warned that the increased flow of freshwater and nitrates into the Gulf could lead to increased phytoplankton growth.⁴⁸

Fortunately, the period from October of 1993 through May of 1994 was slightly dryer than normal for much of the Midwest.⁴⁹ Although spring run-off in the region was normal or below normal in the spring of 1994, flooding returned in a few areas due to heavy localized rains falling upon ground still saturated from 1993.⁵⁰ On April 21, President Bill Clinton again declared parts of Missouri a disaster area "to help individuals and families in that state recover from severe storms, tornadoes, and flooding which began on April 9 and have continued to date."⁵¹ Flooding also spread as far east as Ohio in mid-April. The Soil Conservation Service in Illinois reported significant flooding and

⁴⁵ Usually, the bridges were high enough to remain dry in the center. However, the highway approaches to the bridges were flooded.

⁴⁶ Although the story of the heroic flood fighting efforts and personal losses of Midwesterners is a fascinating one, it is beyond the scope of this study. For more information and photos of the flood and its effect, see publications by the staff of the *St. Louis Post Dispatch*, *High and Mighty: The Flood of 1993* (Kansas City: Andrews and McMeel, 1993) and *The Des Moines Register*, *Iowa's Lost Summer: The Flood of 1993* (Des Moines: Des Moines Register and Tribune Company, 1993).

⁴⁷ Press release, "Agricultural Chemicals Reported in Mississippi Floodwaters," Department of Interior, U.S. Geological Survey, August 30, 1993.

⁴⁸ For statistics on the flood and agricultural chemicals, see Donald A. Goolsby, et. al., *Occurrence and Transport of Agricultural Chemicals in the Mississippi River Basin, July through August 1993*, U.S. Geological Survey Circular 1120-C (U.S. Government Printing Office, 1993).

⁴⁹ See *Special Climate Summary 94/1: Early Season Growing Report*, dated June 1, 1994. National Weather Service, National Meteorological Center, Climate Analysis Center.

⁵⁰ Pringle Pipkin, "Floods Menace Battered Lands," *Kansas City Star*, April 13, 1994.

⁵¹ Press release, "President Clinton Declares Major Disaster in Missouri," The White House, Office of the Press Secretary, April 21, 1994. The President also declared part of Oklahoma a disaster area based upon damage brought about by the same storms that hit Missouri.

damage to structures already weakened by the previous year's disaster. Up to eleven inches of rain fell in some areas, raising fears that 1994 would equal or surpass the devastation of 1993.⁵² This eventuality did not come to pass, as the summer of 1994 proved to be relatively hot and dry.

It was in the context of this severe and widespread flooding that the federal government, including the Soil Conservation Service, responded to requests for assistance from individuals, local governments, and states.

⁵² Carol J. Castaneda, "In Wet Midwest, High Anxiety," *USA Today*, April 14, 1994.

President Clinton, Congress and Flood Relief

By the late spring of 1993, it had become clear that this disaster required resources greater than the individual states could marshal. In mid- and late June, state governors in the Midwest began to call for federal assistance. On June 28 Governor Terry Branstad of Iowa declared a disaster area in fifteen counties and called out the National Guard to assist with sandbagging operations.⁵³ The Governor of South Dakota requested that Secretary of Agriculture Mike Espy declare twenty-five counties in his state a disaster area. On July 1, the governors of Wisconsin, Minnesota, South Dakota, Iowa, and Illinois announced that they were seeking federal disaster aid.⁵⁴ By July 26, President William F. Clinton had declared that major disasters existed in nine states.⁵⁵

The statements and actions of Congress and President Clinton concerning the Midwest flood paralleled the rest of America's: a restrained first reaction in June and early July followed by re-evaluation and a heightened response as the full magnitude of the disaster became apparent. Shortly before traveling to Iowa for a town meeting about the flood on July 8, President Clinton released \$100 million from his disaster fund. He also announced his intention to sign a bill making available another \$297 million and to request additional money from Congress. At that time the President stated that "we know that the damage from this flood is going to be somewhere in the neighborhood of a billion dollars"⁵⁶ He also promised that "We are going to ask that the producers here receive the same benefits as the people who were affected by Hurricane Andrew and other major disasters last year...." Such statements opened the door to a steadily increasing bill for flood recovery.

⁵³ John Dowling, "Guard, Volunteers Called Out to Contain Surging Mississippi," AP wire, June 28, 1993.

⁵⁴ Philip Brasher, "Clinton Promises Aid to Swamped Midwestern Farmers," AP wire, July 1, 1993.

⁵⁵ The last state was North Dakota. The presidential declaration makes selected counties within a state eligible for a wide range of assistance such as Small Business Administration and Farmers Home Administration loans, unemployment assistance, and help rebuilding infrastructure. These nine states included over five hundred individual counties as part of the disaster area. Only in Iowa did the presidential declaration cover every county. The presidential declaration is generally reserved for the most serious disasters and often, though not always, overlaps with an SCS state conservationist's EWP area or a USDA disaster declaration. Since most disasters which require a state conservationist to invoke EWP are in rural areas and are limited in nature, they rarely benefit from a presidential disaster declaration.

⁵⁶ "Remarks by the President in Iowa Town Meeting," The White House, Office of the Press Secretary, July 8, 1993.

The President unveiled his initial \$2.482 billion flood relief plan on July 14.⁵⁷ It included the following amounts:

- \$600 million for the Commodity Credit Corporation
(\$300 million extra upon Presidential request)
- 550 million for the Federal Emergency Management Administration
(\$250 million extra available)
- 153 million for the Department of Housing and Urban Development (HUD)
- 100 million for the Economic Development Administration (EDA)
- 100 million for the Federal Highway Administration
- 70 million for the Small Business Administration (SBA)
- 45 million for the Army Corps of Engineers
(\$20 million extra available)
- 25 million for SCS's watershed and flood prevention operations
- 20 million for the Agricultural Stabilization and Conservation Service's
(ASCS) Emergency Conservation Program (ECP)
- 5 million for the Coast Guard.⁵⁸

On July 17 President Clinton, Vice President Albert Gore, Director of the Federal Emergency Management Administration (FEMA) James Lee Witt, Secretary Espy, Secretary of Transportation Federico Peña, Secretary of Commerce Ron Brown, Secretary of Health and Human Services Donna Shalala, Secretary of Housing and Urban Development Henry Cisneros, Secretary of Labor Robert Reich, head of the Corps of Engineers Lieutenant General Arthur Williams, the Director of the Office of Management and Budget Leon Panetta, and five state governors met in Arnold, Missouri. The tone was more somber than at the previous town meeting, as the unprecedented damage from the flooding became clear.

At this meeting, there was little talk of levees or poor floodplain management policies as possible factors in worsening the flood. Vice President Gore stated that "an extremely unusual weather pattern" was responsible for the floods. Espy also stressed that this was

⁵⁷ It included another \$824 million in contingency funding.

⁵⁸ For more information, see the White House press releases and fact sheets, "President Proposes New Flood Assistance," dated July 14, 1993.

the wettest season on record.⁵⁹ Governors, members of Congress, and local officials at the meeting stated that they did not consider these amounts adequate.⁶⁰ A request to raise this supplemental appropriation was made on July 29.⁶¹

As federal assistance offered to the Midwest increased, a variety of news reports examined the amount of aid sought by politicians, farmers and residents of the Midwest. One article pointed out that the federal government could actually save money, since the disaster relief payments to farmers (estimated at one billion dollars at that time) were more than offset by the expected reduction in agricultural subsidies.⁶² Some questioned the amount of relief payments or the method of disbursing aid.⁶³ Other writers examined the claim that early damage estimates are often unreliable and exaggerated.⁶⁴ In mid-July, a *USA Today* article detailed flood losses in nine states. According to figures gathered from various state agencies, Missouri was among those suffering the worst with thirty to thirty-five percent of the state's cropland affected, crop damage of \$700 million, and property damage of \$2.7 billion. In Iowa, twenty-nine percent of the farmland was flooded, crop damage was approximately one billion dollars, and property damage was \$1.7 billion.⁶⁵ The article stated, however, that the overall economic impact of the floods would be minor compared to Hurricane Andrew.⁶⁶ Such observations were overshadowed by the images of devastation broadcast across the country by television news.⁶⁷

Representative William Natcher, a Democratic member of Congress from Kentucky, first sponsored the relief bill that became law. Public markup was held on July 20. On Tuesday, July 28 the House passed a \$2.77 billion relief bill (H.R. 2667). The most contentious portion of the bill was an amendment offered by Representative Maxine Waters. The California Democrat, who represented the area devastated by the Los Angeles riots of 1992, sought to fund temporary employment in her district. Vocal

⁵⁹ "Remarks by the President in Meeting for Flood Relief and Recovery Mobilization," Arnold, Missouri, July 17, 1993.

⁶⁰ "Remarks by the President in Meeting for Flood Relief and Recovery Mobilization," Arnold, Missouri, July 17, 1993, Office of the Press Secretary. See also "Mississippi Flooding Leaves More Land under Water: Clinton Promises Aid," UPI wire, July 15, 1993.

⁶¹ See Memo from the President of the United States to the President of the Senate, July 29, 1993.

⁶² George Anthan, "Disaster is Saving Money for USDA," *Des Moines Register*, July 20, 1993.

⁶³ See "Opinion Line: Floods, a Taxpayer Bailout?" *USA Today*, July 21, 1993.

⁶⁴ Beth Belton, "Disaster Impact Often Overestimated," *USA Today*, July 21, 1993.

⁶⁵ It is unknown whether these figures were gathered in similar manners in each state.

⁶⁶ James Cox, "Midwest Deluge is No Andrew," *USA Today*, July 21, 1993.

⁶⁷ In fact, Hurricane Andrew was the costliest disaster in history. Most of the recovery costs, however, were covered by private insurance. Recovery cost insurers \$17.5 billion and the federal government \$2.12 billion. Estimating damages in the wake of the 1993 flood was made more difficult since the water was still above flood stage in many areas into autumn. Charmain Kosek, "U.S. Flood Toll at Least \$10.3 Billion," UPI Business and Financial Wire, August 5, 1993.

objections of Republican congressmen were overridden and the bill continued to wend its way through Congress. Another potential roadblock was an amendment by a representative from Ohio to prohibit illegal aliens from receiving any benefits from the relief bill. Beyond humanitarian considerations, when the logistical difficulties of implementing this policy became clear, the amendment was dropped.

The Senate then considered a \$4.3 billion aid plan. The increase from the previous figure stemmed from Clinton's commitment to the governors of nine flood states (Illinois, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin) to provide adequate assistance. The relief package was designed to reimburse farmers ninety percent for losses in excess of seventy-five percent of their crop and fifty percent for any other portion. The Emergency Conservation Program, watershed repair, and the Wetlands Reserve Program (WRP) received a total of \$102 million. The Corps of Engineers received \$235 million for flood control work.⁶⁸ The *Chicago Tribune* reported that \$60 million would go to SCS for rebuilding flood control structures.⁶⁹ In fact, the \$60 million was divided among flood control structures, wetlands, erosion control, streambank protection, and a host of other uses.

The amount had increased to \$4.7 billion when the bill was approved by the Senate Appropriations Committee. Even as this occurred, President Clinton asked that \$1.3 billion be added to that. The final version of the bill was passed on August 10. On August 12, the President signed H.R. 2667, "Emergency Supplemental Appropriations for Relief from the Major, Widespread Flooding in the Midwest Act of 1993." It authorized a total of \$5.8 billion of Federal assistance.

⁶⁸ Robert Greene, "Clinton Raises Flood Aid Request to \$4.3 Billion," AP wire, July 30, 1993.

⁶⁹ Constance Hunt, "Returning the Wetlands to the Water," *Chicago Tribune*, July 31, 1993.

The flood relief bill provided funds as follows:

- \$2.35 billion for disaster payments to farmers through the Commodity Credit Corporation. Also, the President instructed Secretary Espy to make payments for 1993 crop losses at the one hundred percent rate.
- 2.00 billion for FEMA operations in the Midwest and for other disasters
- 389 million for the SBA loans
- 275 million for rural development and housing loans, housing repair grants, and the Extension Service
- 235 million for the Corps' levee and flood control work
- 200 million for the EDA direct assistance grants
- 200 million for HUD for disaster recovery aid to state and local agencies
- 175 million for the Department of Transportation for road repair
- 75 million for Department of Health and Human Services Public Health and Social Service Emergency Fund to repair clinics
- 70 million to repair schools
- 60 million for USDA watershed and flood prevention operations. This money was to be spent on the Emergency Watershed Protection program to repair levees, clear waterways, and enroll cropland in the Wetlands Reserve Program.
- 54.6 million for Title III of the Job Training Partnership Act
- 50 million for HUD's HOME Investment Partnerships Program
- 42 million for ASCS, including \$12 million for temporary employees to speed the application process
- 41.2 million to the Department of the Interior for the U. S. Geological Survey, Fish and Wildlife Service (FWS), the National Park Service (NPS), the Historical Preservation Fund, and the Bureau of Indian Affairs (BIA)
- 34 million for the Environmental Protection Agency (EPA)
- 30 million in supplemental Pell Grant awards
- 21 million for local rail repair
- 10 million for additional SBA staff
- 10 million for the Coast Guard
- 4 million for state youth and conservation corps programs
- 1 million to repair NOAA facilities
- .3 million for the Legal Services Corporation to help flood victims with legal matters

The Soil Conservation Service's \$60 million allocation represented only about one percent of the total.⁷⁰ This amount was divided into two parts. The first \$35 million was available immediately; the remaining \$25 million could be used if authorized by President Clinton. The relief bill stated that these funds could be used for both structural repair work and an emergency wetlands reserve program, but were to be spent by September 31, 1994.

The January 17, 1994, earthquake in southern California spurred more spending for flood recovery work in the Midwest. The California congressional delegation initiated the "Emergency Supplemental Appropriations Act of 1994." According to Senator Tom Harkin's statement in the *Congressional Record*, the White House proposed that additional funds for Midwest flood recovery be included in the bill on January 31.⁷¹ The House report (103-415) on the relief bill which eventually became Public Law 103-211 stated that the August 1993 funds had been appropriated when "waters of the Mississippi and Missouri rivers and their tributary streams were still receding and final estimates of damages were still being developed." The new funding was designed to complete flood recovery work. In early February of 1994, Congress authorized an additional \$340.5 million for SCS "to repair damage to the waterways and watersheds resulting from the Midwest floods and California fires of 1993 and other natural disasters..."⁷² The \$340.5 million figure was based on damage estimates collected from the nine flood states by staff in SCS's Watershed Projects Division, then provided to OMB and Congress. Of this amount, \$50 million was to be made available to repair levees that the Army Corps of Engineers had ruled ineligible for their repair program and that SCS had not previously planned to repair.⁷³ As with the first supplemental authorization of funds in August of 1993, Congress gave SCS the option of spending this money to put inundated land into the Wetlands Reserve Program if the "cost of land and levee restoration exceeds the fair market value of an affected cropland..." One important difference between the 1993 and 1994 appropriations was that there was no time limit on spending the latter. At the same time, the White House rescinded \$22 million of this amount, thus reducing the total available funds to about \$318 million.⁷⁴

⁷⁰ Purely by coincidence, Congress allocated an additional \$3.3 million to SCS's Emergency Watershed Protection Program before recessing for the July 4th holiday. This was not part of the Midwest flood assistance.

⁷¹ February 10, 1994, *Congressional Record*, 103rd Cong., 2d sess., S-1379.

⁷² Public Law 103-211, 108 Stat. 3. It is clear from speaking with SCS staff that they, and supporters of the EWP program in the White House, OMB, and on Capitol Hill, had anticipated this opportunity and were prepared with facts and figures to justify their request for supplemental funds.

⁷³ See the section of this report entitled "Levee Repair" for more information.

⁷⁴ It is important to bear in mind that not all of these funds were spent in the Midwest. Some went to California for earthquake and brushfire recovery, as well as smaller portions for projects in Alaska and Hawaii. The geographic distribution of SCS's disaster recovery efforts was a key factor in garnering Congressional support.

Even after the February 1994 appropriation, SCS's portion of the total federal disaster relief funds was minor. Nevertheless, the Service played a very visible role in flood recovery work, especially in the task of protecting homes, farms, and infrastructure such as bridges, roads, and water supply systems from future flooding.

Overall USDA Response



Secretary of Agriculture Michael Espy tours flooded area in Cache, Illinois. Photo by Meg Evans, USDA.

While the immediate disaster relief efforts of July and August were managed by FEMA, because of the amount of the flooded area in cropland and the importance of commercial agriculture to the economy of the Midwest, Secretary Espy became the logical focal point for many long-term flood recovery efforts. As early as June 23, Governors Walter Miller (South Dakota), Terry Branstad (Iowa), Arne Carlson (Minnesota), Jim Edgar (Illinois), and Tommy Thompson (Wisconsin) sent a letter to the Secretary requesting assistance and urging him to visit.⁷⁵ Shortly after that, the President asked Espy to survey the flooded region.⁷⁶ On June 30, he toured parts of Minnesota, Wisconsin, South Dakota, and Iowa. Over the next several months, the Secretary made over fifteen visits to the Midwest.

⁷⁵ "Midwest Governors Seek New Crop Aid for Flooded Waters," AP wire, June 23, 1993.

⁷⁶ "Statement by the President on the Flooding in the Midwest," The White House, Office of the Press Secretary, June 29, 1993.

An important department-wide effort was the toll-free number created to answer inquiries from the public and press.⁷⁷ The Secretary's office also organized a "Flood Information Center." Located at USDA's national headquarters in Washington, D.C., the Center was made up of representatives from the USDA agencies involved in flood recovery. They answered press inquiries and provided materials for local media throughout the Midwest. SCS focused on assisting the citizens and the media in Missouri. Mary Ann McQuinn was the Service's representative in the Center until early 1994. Bob Stobaugh, a detailee from Alabama, replaced her for a brief time before the Center was shut down in April.

Another aspect of USDA's flood response was the use of a dozen or so personal representatives of the Secretary of Agriculture known as flood coordinators or flood liaisons. They were detailed to the states hit hardest by the floods and were based in ASCS offices. Their job was to keep the Secretary's office informed of problems and progress in the relief and recovery efforts. One of their main functions was to provide information directly to the Secretary unfiltered by any particular government agency inside or outside USDA. They attended major SCS meetings in the nine flood states. In many ways, these men and women served as advocates for flood victims, urging agencies in the federal government to respond quickly and efficiently to those in need. For example, in early 1994 they pushed SCS and the Corps of Engineers to provide clear and complete lists to the public on the levees each would repair.⁷⁸

Although SCS ranked among the most visible of all Department of Agriculture agencies involved in flood recovery efforts, it was certainly not alone. One of the other important organizations was ASCS. Its personnel moved to assist farmers through six programs. First, they modified haying and grazing restrictions on land in the Conservation Reserve Program (CRP), enabling farmers to use land taken out of commodity production for haying or grazing. The "penalty," the reduction in CRP payments for utilizing land in the program, was decreased from fifty percent to twenty-five percent.⁷⁹ This was one of the first official policy changes in response to the floods. Second were Crop Disaster Payments to farmers. Third, ASCS offered livestock feed assistance to farmers who had lost forty percent or more of their feed production. Fourth was the Tree Assistance Program (TAP). Orchard or forest tree seedling owners received cost-share payments to help them replant or rehabilitate trees. Fifth, ASCS relaxed rules for its Price Support Program for rotating reserve commodities. Finally was the Emergency Conservation

⁷⁷ The toll-free number was established in late October of 1993.

⁷⁸ The exact scope of their duties was, at times, a sensitive topic among some Department of Agriculture employees. Other personnel, from SCS and the Corps for example, worked hard to impress the liaisons and seek support for their agencies' positions on flood recovery issues.

⁷⁹ "Senator Grassley: USDA to Alter CRP Haying/Grazing Rules," *FWN*, August 4, 1993.

Program (ECP). The ECP provided cost-sharing to help individual farmers with tasks like removing debris from farmland, leveling damaged land, or repairing damaged conservation practices. Although the extent of involvement varied greatly from state to state, SCS played a role in this effort by supplying technical assistance.

The Farmers Home Administration (FmHA) provided a variety of loans to help those affected by the floods. FmHA's role was divided into two types: farmer assistance and housing assistance. For farmers, loans were available to pay for the replacement of buildings, equipment, livestock, and other capital not covered by insurance. FmHA provided emergency loans for production losses. Loan guarantees and some direct loans were made. Also, FmHA restructured some loans for up to five years. For homeowners, FmHA moved to defer payments, provide housing on a short-term basis, and set aside \$38 million in loans and \$8 million in grants to help elderly rural residents repair their homes.

The Rural Development Administration (RDA) expanded its Emergency Business and Industry Loans Program to include agricultural production and recreation. Funds also were available under the Emergency Community Water Assistance program. Also, nonprofit organizations were eligible for loans under the Intermediary Relending Program. The Food Safety and Inspection Service (FSIS) maintained an "800" number called "USDA's Meat and Poultry Hotline" to answer consumer questions concerning food contamination. The Food & Nutrition Service cooperated with FEMA to manage the Emergency Food Stamp program.⁸⁰ It also provided food directly through the Emergency Food Assistance Program. The Extension Service played an important role in coordinating flood recovery information, especially safety information. It also managed a computer bulletin board through Internet which contained state-by-state reports of the flood and USDA's response.

The above-mentioned agencies each specialized in one aspect of the Department of Agriculture's overall flood recovery effort, such as agricultural commodity production, rural development, housing, or food safety. The Soil Conservation Service focused on repairing damaged waterways and flood control structures in order to protect valuable property like bridges, roads, cropland, and homes. The Service also helped individual landowners with technical advice on restoring the productivity of their cropland. Finally, the agency played an important role in America's efforts to protect wetlands through its Emergency Wetlands Reserve Program.

⁸⁰ The food stamp program received some criticism for giving away too much aid to people who lived outside areas seriously impacted by the flood. For example, see Bill Norton, "After Flood Fraud, Report Suggests Changes in Aid," *Kansas City Star*, December 1, 1993.

SCS and the Emergency Watershed Protection Program

The Department of Agriculture took a lead role in flood recovery efforts, as ordered by President Clinton. The Soil Conservation Service became an important participant in this work through the implementation of the Emergency Watershed Protection (EWP) program.

The Service was created by the Soil Conservation Act of 1935 to attack America's soil and water conservation problems. Through the years, Congress has assigned the Service responsibility for providing technical assistance on land management activities like limiting erosion, drainage, irrigation, and flood control to farmers, local governments, and organizations with state charters such as soil conservation districts. The Emergency Watershed Protection program has grown out of a variety of SCS watershed and flood control efforts. Over the past fifty-eight years, SCS has developed technical expertise in engineering and related disciplines, as well as a national network of almost three thousand offices, which make it the logical organization to help with flood emergencies on small watersheds and in agricultural areas.

"The Flood Control Act of 1936, followed by the Flood Control Act of 1944 and the Watershed Protection and Flood Prevention Act of 1954, made the Department of Agriculture one of the federal participants in flood control work," wrote SCS national historian Douglas Helms.⁸¹ The Service played a major role in these efforts.⁸² Under the 1936 Act, SCS began studies of watersheds to prepare recommendations to Congress on conservation practices. The Service tailored its proposals to conditions in each watershed. Plans might include reforestation, conservation practices on farmland, or flood control structures. A few of these plans were approved for implementation in the Flood Control Act of 1944. SCS's role in water resources has expanded to include involvement in various facets of river basin studies as well as floodplain management and insurance studies. By the late 1980's, the Service had played a vital role in 260 Cooperative River Basin Studies and 442 Floodplain Management Studies. Each

⁸¹ Helms, "Small Watersheds and the USDA," 96.

⁸² For more information, see Douglas Helms, "Watershed Management in Historical Perspective: The Soil Conservation Service's Experience" in *Watershed '93: A National Conference on Watershed Management*, March 21-24, 1993, (Washington, DC: U. S. Government Printing Office, 1994), and John T. Phelan and Donald L. Basinger, *Engineering in the Soil Conservation Service*, Historical Notes Number 2, (Washington, DC: Soil Conservation Service, 1993).

floodplain study included flood hazard maps for rural communities.⁸³ Also, between 1969 and the late 1980's, SCS completed almost five hundred flood insurance studies for the Federal Insurance Administration.

The Small Watershed Program, authorized under the Watershed Protection and Flood Prevention Act of 1954 (P.L. 83-566), was the single most important activity which developed the Service's expertise in flood prevention, control, and recovery. Working with local sponsors, SCS provides technical assistance and cost-sharing for projects on watersheds of fewer than two hundred and fifty thousand acres. Today, flood prevention, water supply, recreation, wildlife habitat, and other uses are all possible targets of P.L. 566 work.⁸⁴ SCS utilizes a variety of structural and non-structural measures such as small dams and land treatment to achieve the project goals. Overall, SCS has provided technical or financial assistance on over twenty-five thousand dams. The vast majority of these structures are small (twenty-five to sixty feet high) and are owned by states, local conservation organizations, towns, or individuals.⁸⁵ Initially, Congress mandated that SCS build no structure with more than five thousand acre feet of storage capacity.⁸⁶ Foreshadowing future disputes over levee repair and the division of responsibilities after the 1993 flood, these size limitations were in part an attempt to create a clear division of labor between SCS work and the larger Corps projects. It is important to note that, although SCS built many dams and was involved in a great deal of land treatment work, it has built or designed relatively few levees. Most levees in the Midwest were and are constructed and maintained by local drainage districts. However, the Service, as a leader in flood prevention and control efforts in rural America, became involved in levee repair through its responsibilities under the Emergency Watershed Program.

⁸³ "Chapter 6: The Knowledge and Information Base," in *Floodplain Management in the United States: An Assessment Report, Volume 2: Full Report* (Federal Interagency Floodplain Management Task Force, 1992), 13-20 to 6-20.

⁸⁴ The scope of small watershed work has increased gradually since the program's inception. In 1958, fish and wildlife development were added. The 1962 Food and Agriculture Act added recreation to the list of possible justifications of P.L. 566 projects. The 1972 Rural Development Act made conservation and land utilization part of the watershed planning work. As of March of 1993, SCS had authorized 1,538 small watershed projects, many designed to obtain more than one objective. Flood prevention was the most important, as it was named in 1,324 projects, drainage in 303, recreation in 274, watershed protection in 236, municipal and industrial water supply in 169, fish and wildlife in 96, irrigation in 89, and rural water supply in 5. Watershed protection work was divided further into erosion control (in 156 projects), water quality (61), and water conservation (9).

⁸⁵ "Chapter 12: Modifying Flooding," in *Floodplain Management in the United States*, 12-23.

⁸⁶ Just as the type of work eligible for the P.L. 566 program has steadily expanded, both the dollar threshold for requiring Congressional approval of structures and the maximum capacity of structures have increased.



Small watershed projects often include terraces, which are an effective way of reducing erosion. Also, by holding water on the land, they can help reduce local flood peaks. These grass-backed terraces are part of over ten thousand miles of terraces installed in the United States to protect cropland. Photo by Tim McCabe, SCS.

Traditionally, SCS has focused more upon flood prevention, that is, holding water on the land upstream from major rivers, while the Corps' work has centered more on flood control, limiting the damage and flow of water on larger rivers. The Corps has more strongly advocated the building of large structures for flood control while SCS has focused on smaller structures or land treatment measures to prevent or limit flooding on the tributaries.⁸⁷ A key part of the conflict between the Corps and SCS has been the usefulness of small watershed projects in flood control or prevention. The well-known work by Luna B. Leopold and Thomas Maddock, Jr., *The Flood Control Controversy*, provides an excellent overview of the different missions, methods, and constituencies of SCS and the Corps as they existed in the 1950's.

⁸⁷ Many authors have detailed these contentious debates, which took place before Congress, within the bureaucracy, and in the press. For example, see Hart, *The Dark Missouri*.

The residents of larger cities located near big rivers generally want flood protection by reservoirs or levees. The agricultural damage on small tributaries far upstream is not of immediate concern to these people, and they would object to any delay in the construction of major dams which might result from attempts to integrate upstream and downstream programs. These downstream interests do not necessarily object to any upstream program, provided its installation does not reduce the degree of protection they desire to delay its activation. These interests support the program of the Corps of Engineers.

People who live farther upstream are aware of the flood damage in the upper tributary valleys. They are close to the erosion problem, and many recognize the need for improved land management. Watershed associations pledged to the conservation of soil and the improvement of land use have been organized in many areas in recent years. These upstream interests are not only proponents of the flood control program of the USDA, but they believe that the program for the construction of big dams downstream could be reduced in scope by the inclusion of a proper upstream program.⁸⁸

Although relatively few large flood control structures have been built since the 1970's, the general outline of the missions and interests of each agency has changed relatively little in recent years. SCS remains committed to upstream flood prevention work and the Corps is still wedded to downstream flood control.

Clearly, both approaches have their merits. As Leopold and Maddock point out, however, upstream programs have only limited local effects and their effectiveness diminishes rapidly as the amount of rainfall increases.⁸⁹ On the other hand, the Corps' program does nothing to help small communities or commercial agriculture on tributaries of major rivers. The authors stress that, despite the rivalry between the two organizations, their programs are in many ways complementary, not competitive.⁹⁰ Nevertheless, the struggle to justify programs and budgets to the public and Congress, as well as sincere disagreements over technical issues, has kept the rivalry alive over the years.

The Service's knowledge, gained primarily through the Small Watershed Program, combined with the field office structure, provides an effective mechanism for carrying out the EWP program. EWP is SCS's way of responding quickly to natural disasters

⁸⁸ Leopold and Maddock, Jr. *The Flood Control Controversy*, 84.

⁸⁹ *Ibid.*, 81. Although based upon research available in the early 1950's, this book offers several strong critiques of upstream treatment and programs as a method of reducing the severity of major floods.

⁹⁰ *Ibid.*, 4.

such as floods, forest or brush fires, hurricanes, tornadoes, drought, landslides, and earthquakes. Section 216 of Public Law 81-516 and Section 403 of Public Law 95-334 (Agricultural Credit Act of 1978) provided the statutory authority for the program. The Secretary of Agriculture delegated the program to SCS, except for EWP measures in national forests or national grasslands, which are the responsibility of the Forest Service. Congress provides funds each year, and supplemental money is often made available to respond to major disasters, as was the case after the 1993 floods.

SCS is structured to maximize flexibility and initiative at the state level. The EWP program is no exception. State conservationists (the lead SCS official in each state) administer the program in their jurisdiction.⁹¹ They can begin the EWP process by declaring a watershed emergency, meaning that a "natural occurrence causes a sudden watershed impairment that creates an imminent threat to life or property."⁹² After this declaration, EWP becomes an agency-wide effort involving all levels of the Service: national, regional, state, area and district. At the national headquarters level, the EWP program has been managed by the Watershed Projects Division, the unit charged with guiding the Small Watershed Program. Technical assistance from the Engineering Division, the Administrative Services Division, or other headquarters organizations is made available. The Office of Public Affairs works with their state-level counterparts to help the press inform the public about the program. SCS has four National Technical Centers: Northeast (Chester, PA), South (Ft. Worth, TX), Midwest (Lincoln, NE), and West (Portland, OR). Besides providing technical assistance to the states, they also help coordinate EWP program implementation in their regions and oversee the shifting of personnel between states to respond to emergencies.

The state conservationist assigns primary responsibility for supervising the day-to-day operations of the EWP program and management of a "State Emergency Response Team" to one member of the state staff, often the assistant state conservationist for water resources. This individual oversees all aspects of EWP work in the state, including funding. Technical specialists, such as state engineers, state administrative officers, and state agronomists have responsibility for their disciplines.

⁹¹ As of early 1994, SCS was organized as follows: under the Chief and an Associate Chief are four Deputy Chiefs (Administration, Programs, Technology, and Strategic Planning and Analysis). The Watershed Projects Division falls under Programs. This National Headquarters staff provides advice and support for operations in the field. There are also four Assistant Chiefs, each responsible for field operations in one region of the country (West, South, Midwest, and Northeast). Then, there are fifty state conservationists, as well as staff in several territories. Many of the larger states are divided into areas. The most local SCS presence comes from cooperation with almost three thousand conservation districts. Most districts cover the same area as a county.

⁹² *National Emergency Watershed Protection Handbook*, U.S. Department of Agriculture, Soil Conservation Service, July 1988.



Debris blocks a bridge near Hannibal, Missouri. Under the Emergency Watershed Protection program, SCS contracted to remove this obstruction. Photo by author.

The area conservationists (AC), who usually oversee between ten and twenty counties, create the local EWP response teams. Teams usually consist of a district conservationist (DC), an engineer, and a technician. The DC is the team leader; the engineer and technician often come from the area office staff. The teams are the units which work most closely with local sponsors. They determine eligibility, inform the local press of EWP work, coordinate outside technical assistance if necessary, and monitor the progress of projects. The DC's, whose bailiwicks are often a single county, serve in perhaps the most important position. They are the initial contact points for the vast majority of those requiring EWP assistance. District conservationists are also the SCS employees most familiar with local conditions.

Within an area declared eligible for EWP program assistance, SCS works not with individual landowners, but rather with local sponsors. One key requirement for EWP eligibility is that the project has public benefits; that is, it must benefit more than one landowner. Sponsors are units of local government with state charters, such as towns, townships, soil conservation districts, levee districts, or drainage districts. They may

request SCS assistance for projects such as removing debris from streambeds, cleaning ditches, repairing levees, or stabilizing eroded streambanks. The sponsors' responsibilities include obtaining land rights for the work and making any necessary cost-share payments.

There are two kinds of threats requiring an EWP response: exigency and non-exigency. The *National Emergency Watershed Protection Handbook* states, "An exigency situation (immediate threat) exists when the near-term probability of damage to life or property is high enough to demand immediate federal action." Contracting regulations are streamlined greatly for exigency work. The district conservationist leads the local EWP response team to inspect the work site, prepares a Damage Survey Report (DSR) and decides whether the work is an exigency. With technical assistance from the area and state offices, the team quickly provides specifications to private contractors. Working with an SCS contracting officer, bids may be received and evaluated, and a contract awarded in as little as one day. These contracts require that work be completed within thirty days after the funds are obligated. Work of a non-exigency nature must follow a more involved contracting process which is similar to regular government practices.

EWP funds will provide seventy-five percent of the construction costs. Formerly, the Service had supplied one hundred percent of the funds for exigency work and eighty percent for non-exigency repairs. The new 75:25 ratio was published in the 1993 revision of the *National Emergency Watershed Protection Handbook*. Since Midwest EWP work was in progress even as these new guidelines were sent to the states, there was a variety of cost-sharing arrangements between SCS and the local sponsors. Staff in the state offices did not want to appear to be "changing the rules in the middle of the game" by modifying the cost-share ratio for the most urgent projects. By early 1994, however, most EWP work was of a less urgent nature (non-exigency) and the 75:25 arrangement became the norm.

Selected EWP Projects, 1973 to 1992

Top SCS staff almost unanimously emphasized that the EWP program has become one of the Service's most popular activities: it has broad public and congressional support. A short review of some typical projects over the past nineteen years brings to light two phenomena. First, the wide range of support stems from the many different types of EWP work performed throughout the country. Second, the scope of the disaster and demands upon SCS in the 1993 flood were far greater than in any earlier incident. Unless otherwise noted, the information that follows comes from *Soil and Water Conservation News*.

Northeast United States, Hurricane Agnes: June 1972

Hurricane Agnes ranks among the most devastating storms in United States history, killing 118 people and causing billions of dollars in damage. SCS was proud that not one the 161 dams previously constructed as part of the Small Watershed Program failed.

Missouri, Flood: April 1973-May 1974

Following a series of major storms, SCS obligated over \$5 million for work under Section 216 of the Flood Control Act of 1950. This included reseeding, debris removal, stabilizing streambanks, and restoring dams, dikes, and levees. The SCS effort was part of a larger Federal Disaster Assistance Administration⁹³ (FDAA) project which spent over \$38 million in 1973 and 1974. SCS also helped ASCS by determining eligibility for cost-sharing to repair flood damage and FmHA by preparing work plans for its Emergency Loan Program.

Teton Dam, Idaho, Dam Collapse: June 1976

After this dam collapsed, a wall of water up to sixty feet high roared through five counties. Eleven persons were killed, over three thousand homes were damaged or destroyed, and over one hundred and twenty-eight thousand acres flooded. Under the Federal Disaster Assistance Administration's leadership, the Corps of Engineers and Bureau of Reclamation rebuilt flood control structures and restored the supply of irrigation water. SCS concentrated on removing debris and gravel bars from streams, as well as debris removal from rural lands. FDAA allocated \$6.7 million.

⁹³ This was the predecessor to the Federal Emergency Management Administration (FEMA).

Monterey, California, Forest Fires: August 1977

Approximately one hundred and seventy-eight thousand acres burned in the second largest forest fire in California history. SCS and local officials were concerned that the lack of ground cover could lead to floods and an additional \$75 million in damages. SCS agreed to carry out watershed repair work costing \$2 million in four watersheds: Big Sur, Little Sur, Carmel, and Arroyo Seco. SCS cleared 145 miles of channels, seeded one hundred and fifty-six thousand acres by air, and seeded 160 miles of fire suppression lanes by hand. Heavy rains in March of 1978 caused only minor damage and the aerial seeding was sixty-five percent successful.

Arvin, California, Wind Erosion: December 1977

An upper air disturbance led to winds reaching speeds of 150 miles per hour for four days. Wind stripped vegetation from hillsides and caused up to two feet of soil loss in some areas. The main irrigation canal was filled completely for five miles. After receiving supplemental funds under the 1950 Flood Control Act, SCS restored and vegetated major gullies and dropped one hundred and eighty thousand pounds of seeds. To date, this has been the only wind erosion project covered by the EWP.

Southern California, Flood: February 1978

A two-year drought ended with six weeks of storms which clogged waterways with silt, eroded streambanks, damaged flood control structures, and caused landslides. President Jimmy Carter declared a seven hundred thousand square mile disaster area. After a \$52 million appropriation from Congress, SCS set about administering 350 projects with almost five hundred contractors from around the country. The work included restoring 420 miles of stream channels, revegetating eighteen thousand acres of land, cleaning fifty-seven debris basins, repairing twelve hundred miles of roads, and repairing twenty-one miles of levees and dikes. This was the largest emergency undertaking to date for SCS. Within three months of obtaining the funds, one-half of the projects were either completed or under construction.

Mount St. Helens, Washington: May 1980

After an eruption with the explosive force of fifty million tons of dynamite, SCS acted quickly to limit the damage caused by stream blockage and erosion. The Service used a supplemental appropriation of \$20 million for the EWP program and \$3 million of Conservation Operations funds. Ash caused increased run-off and erosion. SCS efforts focused on restoring stream channels and revegetation.

Brady's Bend, Pennsylvania, Flood: August 1980

Heavy rainfall over several weeks led to floods that killed seven people and caused the collapse of a railroad bridge. Over the next month, SCS awarded fifteen contracts worth \$1 million to remove debris from streams, reseed over seventy acres, and stabilize streambanks with twenty thousand tons of riprap and gabions.

West Virginia, Flood: November 1985

After a major flood that killed forty-seven and flooded 3,711 homes, SCS began EWP work that would eventually cost \$34.5 million. The first phase lasted six weeks. SCS acted to remove the worst stream blockages in nineteen counties, spending \$2.34 million. Over the first five months of 1986, SCS contracted for \$22 million worth of assistance in fifteen counties. This assistance included restoring channels, reseeding over five thousand acres, and removing debris. SCS oversaw a total of 133 contracts in the first two phases. In the final phase, SCS spent \$5.7 million on repairs in thirteen counties to stabilize streambanks and remove major blockages. FEMA gave \$1.3 million to repair watershed structures. Some landowners complained that not enough was done for farmland restoration; however, such work was beyond the scope of the 1978 Agricultural Credit Act.

Pine Ridge Forest, Nebraska, Forest Fire: July 1989

Following a five-day forest fire that destroyed nearly fifty thousand acres of ponderosa pine and rangeland in the White River Watershed of Nebraska, the SCS and a local sponsor, the upper Niobrara White Natural Resources District, carried out the EWP program. SCS used aerial grass seeding for two thousand acres and built five sediment control basins designed to hold about two acre-feet of excavated sediment. This project limited ash and sediment run-off into the White River.

South Carolina, Hurricane Hugo: September 1989

EWP program work began in October of 1989 and ended in May of 1991. The total cost was \$27.5 million. Contract sponsors included three state agencies, twenty soil and water conservation districts, twenty county governments, and sixty-two municipalities. More than one hundred contracts were completed--2,343 miles of watercourses cleared at a cost of \$23.1 million, fifty-four miles of dunes stabilized at a cost of \$1.1 million, and 349 miles of rivers restored at a cost of \$3.3 million. SCS work provided protection for 61,191 home and buildings, 6,252 roads and bridges, and 172,836 acres of agricultural land. Major contracts included one with the South Carolina Coastal Council to rebuild dunes. SCS worked with the South Carolina Water Resources Commission and the South Carolina Wildlife and Marine Resources Department to open river channels. The Service received the Governor's Award of Excellence for its EWP efforts.

San Francisco Earthquake: October 1989

After the earthquake, landslides choked many streams. The EWP projects cost \$300,000 but California's state conservationist estimated that they prevented a possible \$1.3 billion in downstream flood damages. SCS inspected about fifteen hundred private impoundments and two hundred larger dams. Streams were cleared and landowners advised on how to prevent stream blockages.

Florida and Louisiana, Hurricane Andrew: August 1992

Following the single most expensive natural disaster (\$25 to \$30 billion in damages) in United States history, SCS moved quickly to assist in flood recovery. Most EWP work focused upon removing debris from channels or canals, a task made more difficult because many homes or structures had been built next to the canals and many low bridges had been constructed over them. The Service's main goal was to restore the natural drainage to these areas. These efforts also required more detailees than previous EWP efforts. Many contracting officers who would be sent to the Midwest in 1993 gained valuable experience during their time in Louisiana and Florida.

Hawaii, Hurricane Iniki: September 1992

Even as national attention and SCS resources focused upon Hurricane Andrew recovery efforts, Kauai, Hawaii, was devastated by winds and rain. The island suffered about \$1.25 billion in damage. SCS was present at the five Disaster Application Centers set up by FEMA. The Service handled about 350 Emergency Conservation Program applications and many EWP projects for stream debris removal. Unlike many EWP efforts, this one focused on residential areas.

These EWP program accomplishments showed that the SCS could respond successfully to a wide variety of natural disasters. The greatest test was yet to come as the scope, severity, and longevity of the 1993 flood required an effort far greater than anything the Service had done previously.

EWP Implemented in the 1993 Floods

Many of the most pressing concerns expressed by citizens in flooded areas coincided closely with the work performed by SCS through its EWP program. A survey of over eighty ASCS offices in the nine flood states provided a window into the needs of local communities as recovery work got underway.⁹⁴ Under the heading of short-term recovery, "debris removal, clear off sand/silt, restore dikes/levees, stabilize river banks" were areas of great demand. The EWP program assisted with all of these problems. The Service also encountered concern over the ability of farmers to meet the deadline for conservation compliance plans.⁹⁵ Other important issues included compacted soil and drainage. For the longer-term, financing levee repair was a major worry. Two frequent complaints were the confusion over responsibility for levee repair or the lack of decisions on local repairs. These became some of the most difficult and time-consuming issues SCS faced.

By July of 1993 state conservationists in Illinois, Iowa, Minnesota, North Dakota, South Dakota, Missouri, Kansas, Nebraska, and Wisconsin had invoked the EWP in part or all of their states. On July 22, the Soil Conservation Service announced that Karl Otte, assistant director of the Watershed Projects Division, was to head the SCS Flood Emergency Response Team at the national headquarters level. Other members included Larry Babich and Tom Wehri from the Watershed Projects Division, Warren Lee of the Conservation Planning Division, Mike King of the Administrative Services Division, and Mary Ann McQuinn of the Office of Public Affairs. The team met often with the director of the Watershed Projects Division, director Lloyd Wright. They concentrated on three flood recovery tasks. First, staff coordinated SCS assistance across state and regional lines. Second, they facilitated cooperation with other parts of USDA and other government agencies, particularly FEMA and the Corps of Engineers. Third, they oversaw the formation of new policies or procedures, such as rules for an expanded Wetlands Reserve Program or levee repairs.

⁹⁴ "Flood Recovery Information and Concerns," Agricultural Stabilization and Conservation Service (ASCS), October 6, 1993.

⁹⁵ In the 1985 Food Security Act (FSA), ASCS financial benefits to farmers were tied directly to soil and water conservation. The Service helped farmers develop conservation plans to limit soil erosion and then monitored their implementation. Only by successfully implementing these plans prior to December 31, 1994, would farmers remain eligible for many USDA benefits.

On June 30, the Watershed Projects Division completed its first daily report on EWP work.⁹⁶ Over the next few months, the director or acting director of the division sent reports on a daily, then semi-weekly, and finally weekly basis to the office of the Secretary of Agriculture and other top USDA officials. Like all other initial estimates of damages and workload made by those inside and outside the government, these reports proved to be overly optimistic. The Service predicted that data on flood damage and repair estimates would be complete in several weeks, after the water level declined. Actually, flood waters remained too high in some areas to permit damage surveys until the spring of 1994.

At the national headquarters level, SCS sought to forge a uniform approach to EWP work. One way to do this was to deal with the nine flood-affected states as a whole through meetings or teleconferences. For example, the headquarters' Emergency Flood Response Team sponsored an EWP Workshop in Kansas City, Missouri, in late July. SCS personnel from headquarters, each of the nine flood states, and the Midwest National Technical Center (MNTC) attended, as did representatives of ASCS, EPA, FEMA, and the Corps of Engineers. The minutes of this workshop reveal much about the Service's plan of action. First, SCS made clear that FEMA was the lead agency at this early stage of flood recovery. Second, it was vital for the Service to learn from its previous disaster recovery experiences. National headquarters staff distributed samples of EWP documents, press releases, and construction specifications which had been used in Louisiana after Hurricane Andrew. Third, SCS personnel from other regions would be shifted to help keep up with the increasing EWP workload. Fourth, interagency cooperation was vital after so large a disaster.

ASCS personnel at the workshop explained the workings of the Emergency Conservation Program. SCS state offices estimated that they faced a total of \$131.8 million in EWP requests (This figure includes the nine states mentioned earlier, Kentucky, and Indiana).

⁹⁶ These reports were made up of the highlights of reports sent in by fax from each of the flood states.

SCS and ASCS Damages Estimates--July, 1993

<u>State</u>	<u>Main Type of Work</u>	<u>EWP Estimate</u>	<u>ECP Estimate</u>
Iowa	debris removal, bank stabilization, levees, road, bridges	\$41 million	\$12 million
Missouri	debris removal, levees	36.9	10
Kansas	debris removal	19.8	9.1
Illinois	debris removal	10.8	9.1
North Dakota	debris removal	6.6	1
South Dakota	debris removal, levees	4.9	1
Minnesota	debris removal	4.9	6
Nebraska	debris removal	4.1	6
Wisconsin	debris removal, bank stabilization	1.8	10.9
Kentucky	debris removal, bank stabilization	.8	.5
Indiana	bank stabilization	<u>.16</u>	<u>0</u>
Total:		\$131.8	65.6

The national headquarters staff also coordinated the flow of information between the field level and Congress. For example, Watershed Projects Division staff met with members of Congress, their staffs, and committee staffs to explain the EWP program as well as to detail progress in flood recovery work. In mid-November, Jeffrey Vonk, state conservationist from Iowa, testified before the Subcommittee on Environment, Credit and Rural Development, and the Subcommittee on General Farm Commodities (both part of the House Committee on Agriculture). He first provided rough damage estimates. In Iowa, severe erosion damaged 2.4 million acres of cropland; conservation practices suffered over \$12 million in damages. He stated that ten percent of the terraces and eighty percent of the waterways installed in the last two years required repair. On a positive note, the 2.4 million acres damaged in 1993 marked a great improvement over the four million acres damaged by floods in 1984, when the state was hit by much less severe rain. He credited the application of conservation practices for this progress.

Vonk then explained the benefits of SCS's Emergency Watershed Protection program and detailed the distribution of the \$35 million initial allocation among the states:

Illinois	\$4.7 million
Iowa	9.2
Kansas	5.9
Minnesota	1.2
Missouri	7.5
Nebraska	.9
North Dakota	1.5
South Dakota	1.7
Wisconsin	1.0
Program Support ⁹⁷	1.4

Finally, Vonk pointed out two problems in flood recovery efforts. First, standing water was delaying damage evaluation and repair efforts. Second, simultaneously implementing EWP and enforcing the conservation compliance provisions of the 1985 Food Security Act (FSA) could strain SCS's resources. Under FSA, individuals farming highly erodible land must carry out an SCS-approved conservation plan to remain eligible for USDA benefits. The plans were to be in place by December 31, 1994, but Vonk estimated that three hundred and fifty thousand to four hundred thousand farmers would be required to modify them due to the floods.⁹⁸ Although state conservationists had the authority to grant variances to this deadline, SCS staff sought to make those on Capitol Hill aware of this issue in order to obtain acquiescence, if not support, should many variances prove necessary.

On November 17, 1993, SCS requested the balance of the \$60 million authorized in the flood relief bill. Two days later the White House released the last \$25 million. By December, as the needs of individual states became more clear, the national headquarters distributed not only the entire \$60 million supplemental appropriation, but also over \$10 million of its regular EWP allocation.⁹⁹ Decisions concerning funding for EWP repair projects and Emergency Wetlands Reserve Program (EWRP) easements were based

⁹⁷ This figure includes money for the national headquarters and MNTC.

⁹⁸ "Statement of Jeffrey Vonk, State Conservationist-Iowa, before the Subcommittee on Environment, Credit and Rural Development and the Subcommittee on General Farm Commodities, Committee on Agriculture, November 19, 1993." SCS received enthusiastic support before Congress from state officials. For example, see statements by John L. Saunders, Director, Missouri Department of Agriculture, and Dale M. Cochran, Secretary, Iowa Department of Agriculture and Land Stewardship at the same hearing.

⁹⁹ "Soil Conservation Service, Emergency Watershed Protection Program, Midwest Flood Recovery Work," December 6, 1993. This was a short report prepared by Karl Otte of the Watershed Projects Division.

upon this limited amount of money. In February of 1994, however, a supplemental appropriation provided over \$300 million to expand SCS's short-term flood recovery and long-term flood prevention work. Generally, the additional funds did not lead to new requests for assistance from the public; rather, this money allowed the Service to complete more of the projects for which a need had already been established.

The next major development in the Watershed Projects Division's coordinating activities came in mid-March of 1994, when another flood recovery meeting was held in Kansas City, Missouri. SCS representatives from the national headquarters, the nine flood states, and the MNTC attended, as did personnel from the Corps, EPA, FEMA, and state departments of natural resources. The goals of this meeting were to plan for the 1994 construction season, distribute funds among the states from the supplemental appropriation, discuss problems and share ideas on improved disaster response, develop levee repair criteria with FEMA and the Corps, and refine the wetlands rules following an audit by the USDA's Office of the Inspector General (OIG).

At the meeting, Karl Otte, in consultation with fellow staff members in the Watershed Projects Division and the flood states, announced the initial distribution of the supplemental appropriation.¹⁰⁰ The funding levels were based on the number, type, and size of requests for EWP work in each state:

EWP Initial Allocations
(in thousands)

State	August 1993 Appropriation and Other SCS Funds (WF-16 and 34)	March 1994 Appropriation (WF-35)	Total
Illinois	\$13,040	\$ 8,400	\$21,440
Iowa	20,655	61,000	81,655
Kansas	9,830	11,100	20,920
Minnesota	1,800	2,300	4,100
Missouri	22,775	48,300	71,075
Nebraska	1,110	2,000	3,110
North Dakota	1,475	1,200	2,675
South Dakota	3,915	10,000	13,915
Wisconsin	1,220	700	1,920
Totals:	75,810	145,000	220,810

¹⁰⁰ These figures do not include \$50 million from the March appropriation that was explicitly directed to rebuild levees which the Corps and SCS had previously rejected. Nor does it include funds for the Emergency Wetlands Reserve Program, which was a different account.

Although the conflicts between federal agencies became most visible to outside observers, there were different priorities within each organization as well. An important issue raised at many SCS meetings by staff members from the state offices was the need to focus more attention on state government policies, priorities, and problems. States play an important role in writing land use laws; they own a great deal of land; their departments of conservation and agriculture have close ties to many landowners and an in-depth understanding of local conditions; they often fund employees who work in conservation district offices; they build and finance roads and other infrastructure in rural areas; and they make the laws which charter soil conservation districts, drainage districts, levee districts and other related branches of local government. One state conservationist suggested that the federal government use its financial resources as an incentive to get individual states to take a more active role in flood prevention and control.

Several state conservationists also stressed that the national headquarters should focus upon results, such as the number of flood recovery projects completed or communities assisted, and not upon erasing differences in approaches to EWP work taken by various state offices.¹⁰¹ Others put the need for variation between states into the context of "empowering" employees to make decisions at the local level. They specifically pointed to the four hundred square mile dividing line between SCS and the Corps levee repair projects as the sort of arbitrary decision that greater participation from the state level would have prevented.¹⁰² Many felt that cooperation between state offices and the Corps' district offices was good until each agency's national headquarters became involved in decisions.

Utilizing the data compiled by Bob Bartles, Midwest Flood Recovery Coordinator at the Midwest National Technical Center, the Watershed Projects Division became a clearing house for information on flood recovery efforts. One way to look at the workload faced by SCS is through the demands placed upon personnel resources. To enable the Service to keep pace with requests for EWP assistance in the four states most devastated by the flood (Illinois, Iowa, Kansas, and Missouri), outside help was brought in. From August 1993 through June 1994, over two hundred engineers, contracting officers, soil conservationists, district conservationists, and others provided assistance. During the busiest period (August through November of 1993) detailees supplied a total of 606 person/weeks of assistance to SCS operations in these four states. Bob Bartles predicted that a total of 1,260 weeks of outside assistance would be devoted to flood recovery by

¹⁰¹ Variations between states included the organization of each state's EWP effort, methods of working with sponsors, dividing responsibility for levee repairs with the Corps, SCS involvement in state DFO's, approaches to conservation compliance, wetlands easements, and overtime payments for regular staff and detailees. Most of these differences, however, were concerned with the methods, not the goals, of flood recovery.

¹⁰² See the section on levee repair for more details.

October 1, 1994.¹⁰³ Most important were SCS employees from other states; they numbered 158 and supplied 831 person/weeks of help. Next came thirty-six employees from the U. S. Forest Service, who gave 282 weeks of their time. Third were the Canadian volunteers from the Prairie Farm Rehabilitation Administration, an organization with a mission roughly equivalent to that of SCS. Ten volunteers provided 139 person/weeks of assistance in such important areas as engineering and damage assessment. Finally, three volunteers from the California Association of Flood Control Agencies provided nine person/weeks of help. Turn-over among detailees was high, as only thirty-three worked longer than ten weeks on flood recovery work.¹⁰⁴

As the following charts illustrate, the volume of EWP work was impressive. By July 1 of 1994, SCS staff had prepared 4,298 DSR's for work in three general categories: debris removal, erosion control, and levee repair. Almost half the requests (forty-five percent) for assistance were for debris removal from streams, often around bridges. The balance was split between levee repair (twenty-two percent) and erosion control (thirty-four percent).¹⁰⁵ The actual number of projects eligible for EWP assistance, however, numbered only 2,441 (forty-five percent for debris removal, thirty-seven percent for erosion control, and nineteen percent for levee repair). Although survey reports and repair work were severely hampered by standing water in many of the nine states, 1,490 projects were under contract or completed by the beginning of July 1994.¹⁰⁶ The various state staffs estimated that it would cost about \$96 million (\$74 million for contracts and \$22 million for technical assistance) to complete this work. The contracting costs for levees were expected to be only fifteen percent of the total contracting costs.

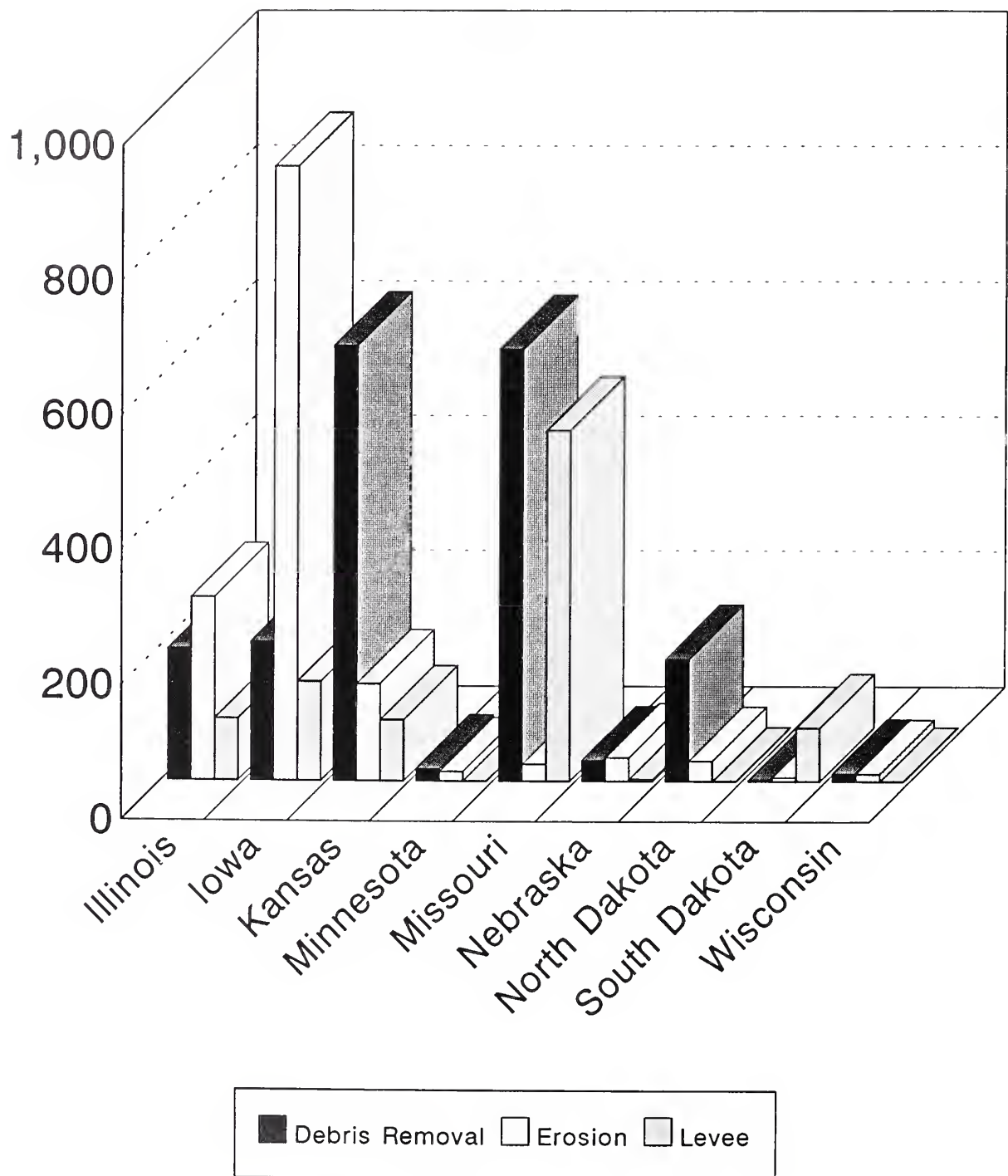
¹⁰³ The average work-week for these detailees was sixty hours.

¹⁰⁴ Report sent via fax from Bob Bartles, MNTC to the Watershed Projects Division, August 8, 1994.

¹⁰⁵ Numbers may not equal one hundred percent due to rounding.

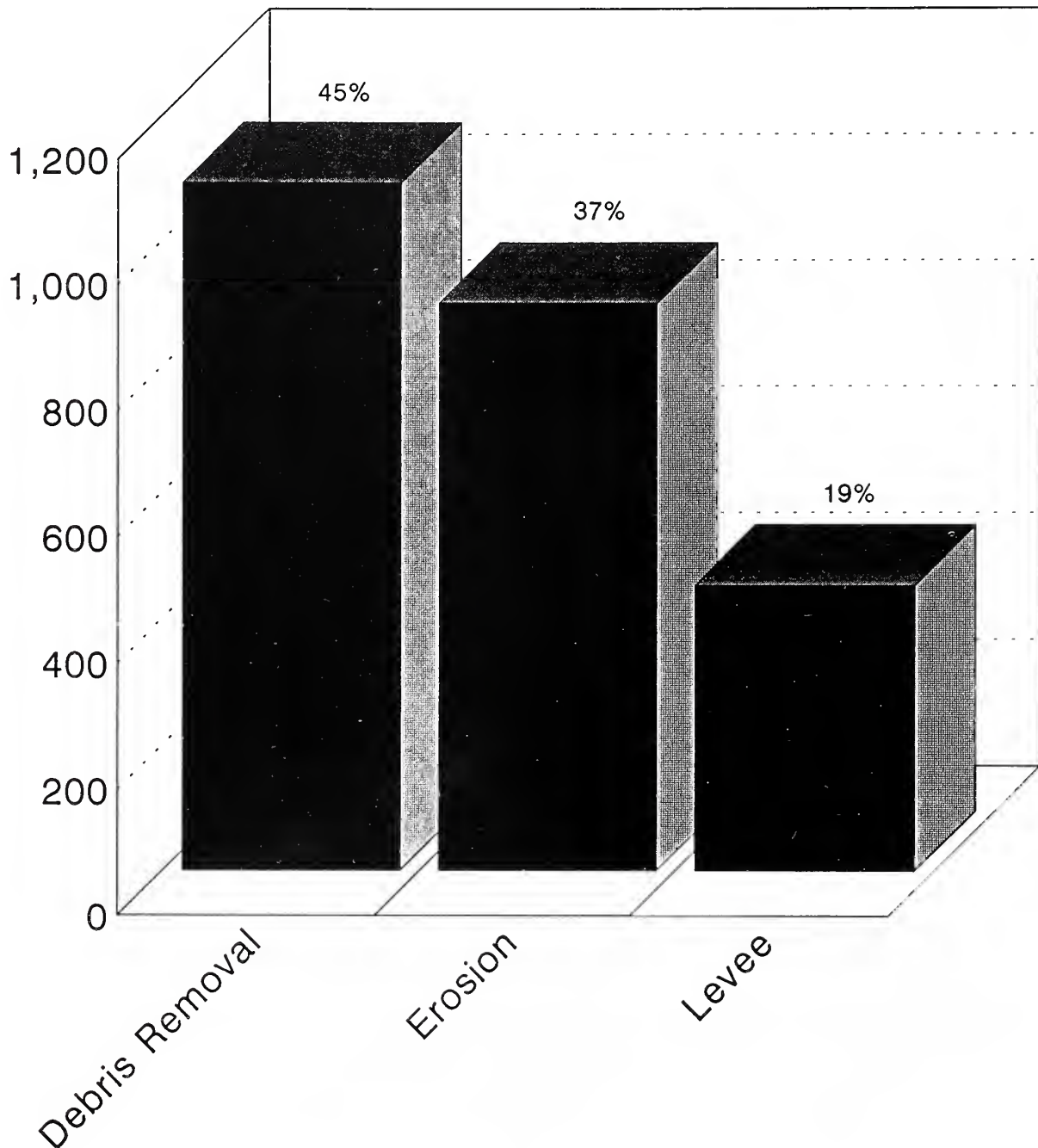
¹⁰⁶ A valuable resource for tracking the progress of the Service's EWP efforts was the monthly reports prepared by the staff of the Watershed Projects Division.

Damage Survey Reports Received



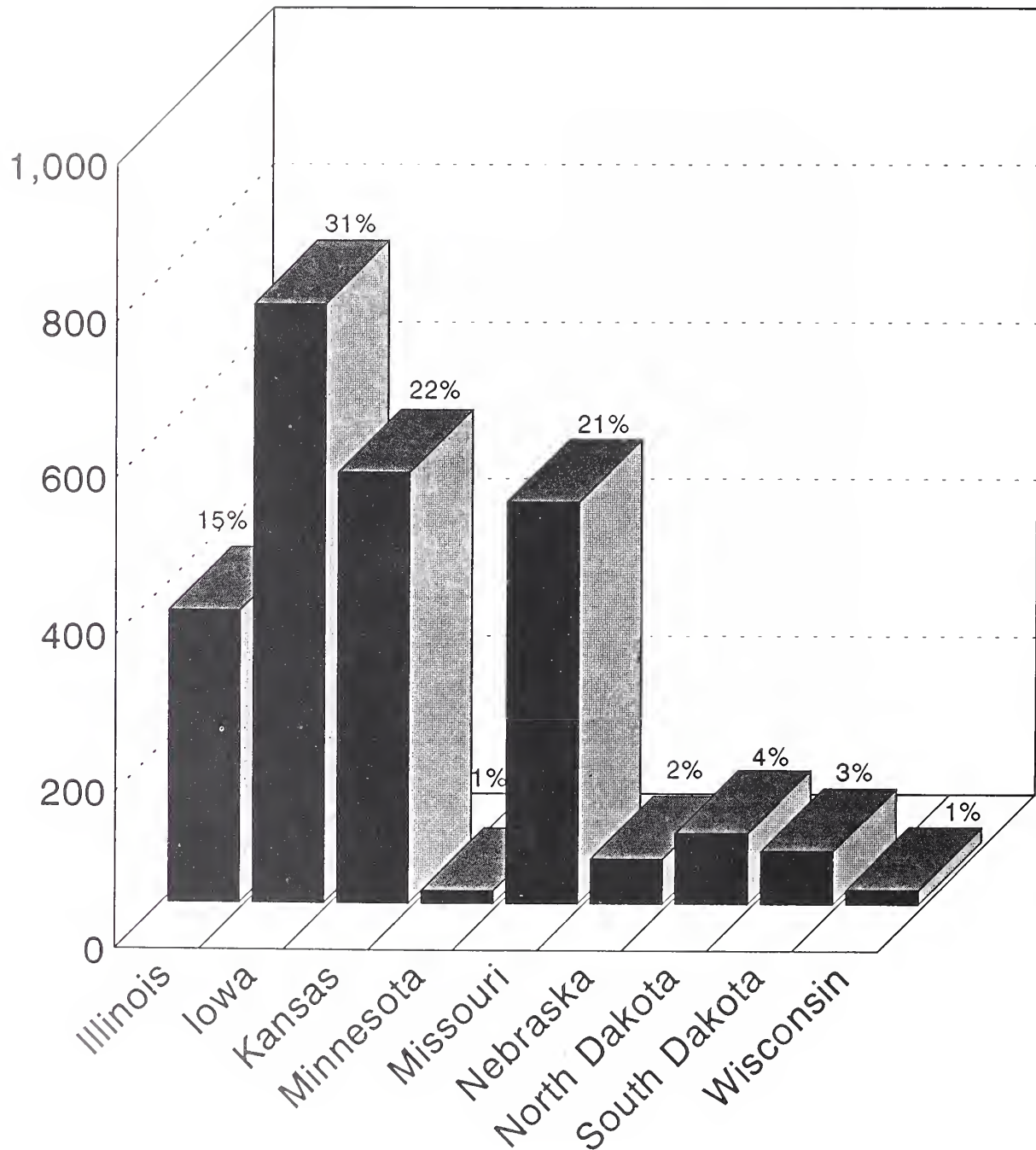
Total = 4,298 Projects

Projects Eligible for EWP



Total = 2,441 Projects

Projects Eligible for EWP



Total = 2,441 Projects

Flood Control and Floodplain Management Debates

Even as personnel in the field completed Damage Survey Reports (DSR's) and emergency repair work got underway, the Service found itself in the midst of heated national debates over floodplain management and flood control policies.¹⁰⁷ Besides the immediate needs and pressures of the flood recovery work, the prominence of these disputes reflected shifting political winds, changing demographics and the decline of the American farmer, and budget restraints on flood control projects and agricultural subsidies. SCS experts in Washington and the Midwest participated in studies of floodplain management organized by the Clinton White House. As a result, the Service played a role in shaping long-term federal policies.

SCS's flood prevention and recovery work must be placed into the context of long-term trends in floodplain management. For example, the Federal Interagency Floodplain Management Task Force was one of many committees established to attack the problem of floodplain management over the years. Its 1992 report placed their efforts into a four-part chronological framework for understanding the changing federal role in flood control. The 1900 to 1960 period was the "Structural, Federal Era." During these sixty years, the Corps of Engineers built dams and other structures in the major river bottoms. These projects were authorized by legislation like the Flood Control Acts of 1917, 1928, and 1936. SCS gradually became involved through the Flood Control Act of 1936 and the Watershed Protection and Flood Prevention Act of 1954. The latter law created the Small Watershed Program, which focused on structural measures during this period.

At their most extreme, experts saw nature as something broken that needed repairing. For example, at a 1908 symposium on Missouri River flood control, one participant stated that "in no portion of her works has Nature left so much to be done by the engineer to supplement her deficiencies as in the modification of the natural flow of streams."¹⁰⁸ According to Corps of Engineers historian Martin Reuss, it was not until 1936 that "an official government document recommended something other than building dams, floodwalls, and levees to protect life and property."¹⁰⁹

¹⁰⁷ The glossary to the Interagency Floodplain Management Review Committee's July 1994 report defines floodplain management as "A decision-making process whose goal is to achieve appropriate use of the nation's floodplains. Appropriate use is any activity or set of activities that is compatible with the risk to natural resources and human resources. The operation of an overall program of corrective and preventative measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works, and floodplain management regulations."

¹⁰⁸ Stout, "The Relation of Power and Irrigation," in *The Control, Development, and Utilization of the Missouri River*, 353.

¹⁰⁹ Martin Reuss, "Coping with Uncertainty: Social Scientists, Engineers, and Federal Water Resources Planning," *Natural Resources Journal* 32, 1 (Winter, 1992): 101-136.

According to the 1992 Task Force's report, the 1960's were "A Time of Change" when alternatives to structures began to receive greater attention, including efforts to reduce flood hazards through zoning, land use regulations, flood forecasting, relocation, and new methods of water storage. The increasing use of the phrase "floodplain management" during this period reflected the interest in cooperative efforts among all levels of government and various professions. Such efforts grew from a growing recognition of the need for a comprehensive approach to flood control, water supply, and environmental concerns in the floodplains.¹¹⁰

The increasingly influential environmental movement as well as ever-tightening budget constraints on construction work have led to greater criticism of structural measures in flood control. For example, at a conference in early 1968, J. W. Howe, Chairman of the Department of Mechanics and Hydraulics at the University of Iowa, made statements that could easily have been uttered after the 1993 Midwest flood. In evaluating structural measures, he wrote that

complete flood control is not usually achieved; but the public, with complete faith in the protection works, rushes in with construction clear to the river bank, little realizing that damage frequency has been reduced, but not its inevitability.¹¹¹

He also addressed the issues of benefit-cost analysis and conflicts over property rights when restrictive regulations are implemented in order to limit flood damages, two other problems that stirred debate in 1993 and 1994.

The 1970's were deemed "The Environmental Decade." A variety of new laws, beginning with the National Environmental Policy Act of 1969, marked a continued movement away from the use of structural measures. Several executive orders issued during the Carter administration stressed that federal agencies needed to consider wetlands and floodplains in their work. Also, during this period, states and local communities became more involved in floodplain management. The Service, with its increased emphasis on water quality and land treatment measures in its Small Watershed Program, was part of these trends. The 1980's were the period of "Continuing Evolution." Efforts in this decade focused on carrying out the policies and procedures mandated in the 1970's.¹¹²

¹¹⁰ James E. Goddard, "Man Should Manage the Flood Plains," in Dougal, ed., *Flood Plain Management*.

¹¹¹ J. W. Howe, "An Introductory Philosophy of Flood Plain Management," in Dougal, ed., *Flood Plain Management*.

¹¹² "Chapter 3: Floodplain Development and Losses" in *Floodplain Management in the United States*, 3-16 to 3-20.

These trends continued into the 1990's. The concept of using floodplains for flood control had gained acceptance before 1993's disaster. For example, the 1992 Federal Interagency Floodplain Management Task Force report stated that

natural, unaltered floodplain systems can reduce flood velocities, reduce flood peaks, and reduce wind and wave impacts because their physical characteristics affect flood flows, and typically, provide space for the dispersal and temporary storage of flood waters until the natural drainage can carry the water away. The natural function obviously can reduce the potential damages and loss of life from floods.¹¹³

Within the context of these general trends, it is vital to bear in mind that each of the different approaches to flood control and floodplain management comes with its own agenda.¹¹⁴ Not surprisingly, solutions offered to the problems of flood control have corresponded closely to the duties of the author and his employer. For example, in 1928, E. A. Sherman, associate forester of the Forest Service, wrote that

in times past, even before the white man had disturbed the heavy forests of the Mississippi River Basin, floods were known there. With the settlement of the country, forest fires, overcutting, and the abuse of forest and other lands have served to increase the possibility of floods and their severity and the amount and extent of erosion.¹¹⁵

The Corps, chief builder of levees and dams, has been accused of being fixated on structural measures of flood control. SCS has traditionally focused on the needs of smaller rural communities and commercial agriculture through its small watershed approach. These attitudes, sometimes conflicting and sometimes complementary, along with local, state, and federal rivalries, have hampered cooperation and coordination in floodplain management.¹¹⁶

¹¹³ *Floodplain Management in the United States: An Assessment Report, Volume 1: Summary Report* (Federal Interagency Floodplain Management Task Force, 1992), 9.

¹¹⁴ Luna and Maddock begin their well-known history, *The Flood Control Controversy*, with the line, "Flood control has grown to be a big business." Luna and Maddock, 3.

¹¹⁵ E. A. Sherman, *The Protection Forests of the Mississippi River Watershed and Their Part in Flood Prevention*, U.S. Department of Agriculture, Circular No. 37, August 1928, 1.

¹¹⁶ It is important to note that some authors believe that the division of flood control and prevention responsibilities and missions "at least has the advantage of bringing differences to light; and the vigor generated by the clash of ideas and opinions--even though the clash is at times wasteful--provides a forceful approach to the flood control problem." Luna and Maddock, *The Flood Control Controversy*, 237.

As was the case after other major floods, the interest in flood control and floodplain management picked up dramatically in late 1993. Some framed the debate simply by stating that "Farmers and other landowners want levees repaired and things returned to pre-flood conditions. Environmental activists, on the other hand, want the government to abandon some levees and to replace farmlands with wetlands."¹¹⁷ Others take a more comprehensive view. In an article co-authored with Mary Fran Myers, longtime commentator on America's water resource policies, Gilbert F. White, wrote that "It seems possible that, within the current window of opportunity, the nation could resolve three major issues." The first issue was levee repair. Second was floodplain management. Third was a comprehensive water management policy for the entire United States. The authors stressed that many issues received attention recently only due to the flood.¹¹⁸ White and Myers called the interest in relocating flood-damaged structures "unprecedented," and discussion of alternatives to levee reconstruction a "pioneering effort."¹¹⁹

Congress held a variety of hearings on topics such as hazard mitigation (relocating away from the floodplain) and cost-sharing for flood control structures. As Chairman of the Senate Committee on Environment and Public Works, Max Baucus, stated during November, 1993 hearings,

The flood raises important questions. For instance, should the Federal Government repair levees that have not been properly maintained or should we focus on the creation of nonstructural solutions like wetlands instead. Moreover, how do we pay for needed repairs to all levees with limited Federal resources?¹²⁰

The Association of State Floodplain Managers and the Association of State Wetlands Managers also held major conferences to discuss these issues.

One common complaint voiced by those both inside and outside the government was that the flood control and floodplain management policies were uncoordinated and often contradictory. For example, two unusual bedfellows, environmental groups and the Corps, agreed on the need for a more unified and centralized approach; however, they

¹¹⁷ Jim Patrico, "The Levee Fix," *Top Producer* (March 1994): 32-34.

¹¹⁸ Mary Fran Myers and Gilbert White, "The Challenge of the Mississippi Flood," *Environment* 35:10 (December 1993), 7-8.

¹¹⁹ Myers and White, "The Challenge of the Mississippi Flood," 29-30.

¹²⁰ Opening Statement of Hon. Max Baucus, U.S. Senator from the State of Montana, Committee on Environment and Public Works, November 9, 1993. Many statements by Senators are contained in a short publication, *Federal Response to the Midwest Floods of 1993*, Hearing before the Committee on Environment and Public Works, United States Senate, 103d Congress, First session, S. Hrg. 103-434 (Washington: U.S. Government Printing Office, 1994).

differed greatly on what organization should be in control. In early August 1993, American Rivers requested that President Clinton investigate problems with flood control policies. The organization complained that no single agency was in command of flood control efforts and that local, state, and federal programs often contradicted one another.¹²¹ In a report by Reuters, Lieutenant General Williams, Commander of the Corps, stated that the flood damages were greater than they might have been due to the mismatched flood control systems built by local, state, and federal agencies. He called for a uniform system similar to that already under the Corps' management for the lower Mississippi River from Cairo, Illinois, to the Gulf of Mexico.¹²²

A *Christian Science Monitor* opinion piece criticized the lack of a single authority over the upper Mississippi River. It also attacked the Corps' attempt to use levees for flood control. The author, an adviser to the Committee for the National Institute for the Environment, claimed the lack of coordination among agencies proved the need for a federally-funded National Institute for the Environment.¹²³ Similar calls for a unified approach to the Mississippi River came from the National Fish and Wildlife Foundation.¹²⁴ As Senator Paul Simon pointed out, "North of Cairo, Illinois, it's just a patchwork, the Corps of Engineers takes this, a local levee or drainage district takes that, a State takes that. There is no system and I think we ought to look at what should be done."¹²⁵

In late August, the White House responded to these pressures and formed a task force to discuss alternatives to levee reconstruction. Participants included FEMA, the Corps, SCS, the FWS, EPA, OMB, and the White House Office of Environmental Policy. In October the group expanded its duties into an assessment of floodplain management on the upper Mississippi and lower Missouri.¹²⁶ This formally became the White House Interagency Floodplain Management Review Committee in January of 1994. Under the leadership of Brigadier General Gerald Galloway, the Committee had several goals:

¹²¹ "American Rivers Calls for Comprehensive Review of National Flood Control Policy As Flood Waters Recede," U.S. Newswire, August 11, 1993.

¹²² "Delays Seen in Repair of U.S. Floods Damage," Reuters wire service report, August 4, 1993.

¹²³ David Blockstein, "Heeding Nature's Warnings," *Christian Science Monitor*, September 14, 1993.

¹²⁴ "The Mississippi River Initiative," (part of the National and Fish and Wildlife Foundation's fiscal year 1994 Fisheries and Wildlife Assessment) National Fish and Wildlife Foundation, 96.

¹²⁵ "Statement on Hon. Paul Simon, U.S. Senator from the State of Illinois," in *Federal Response to the Midwest Floods of 1993*, 10.

¹²⁶ Between 1966 and 1986, four major efforts have been made to develop a rational and unified approach to floodplain management. These efforts began with House Document 465 "A Unified National Program for Managing Flood Losses."

[T]o undertake an intensive review to determine what happened and why in the Mississippi River Basin floods of 1993 and to make recommendations as to what changes in current policies, procedures, and programs would most effectively achieve the goals of floodplain management: risk reduction, economic efficiency, and environmental enhancement.¹²⁷

SCS personnel from the Watershed Protection Division participated in this effort. Tom Wehri, assistant director of that division, attended its White House meetings and played an important role in the Committee's work. The final report was delivered to the Clinton Administration in June of 1994.

The Service also participated in the effort to provide technical information to the Interagency Committee. In Sioux Falls, South Dakota, the Scientific Assessment and Strategy Team (SAST) was formed under the guidance of John Kelmelis of the U. S. Geological Survey. SAST was charged with "organizing existing databases to aid in the near-term and long-term decision-making process."¹²⁸ James Reel, from the water resources planning staff at the Iowa state office, David Buland, an economist from Huron, South Dakota, and Maurice Mausback from the national headquarters in Washington were the SCS participants in this group.¹²⁹ Besides combining data from a wide variety of sources and government agencies (both federal and state), four reports involving SCS activities were prepared: 1) investigating the Food Security Act and the effect of land treatment practices on run-off, 2) looking at the relationship between land use changes caused by the Conservation Reserve Program and run-off, 3) examining the flood damage reduction caused by the Small Watershed Program, and 4) investigating four model watersheds in the Midwest to see the results of various programs singly and in combination.¹³⁰

¹²⁷ "Floodplain Management Review: Information Update," press release from the Floodplain Management Committee, February 7, 1994. As structured after January of 1994, the following agencies were full-time members on the Committee: the Corps, USDA (SCS and the Economic Research Service), Department of Interior (FWS, Geological Survey, and National Biological Survey), EPA, and FEMA. The following groups provided support: Office of Environmental Policy, OMB, the Council of Economic Advisors, the Council on Environmental Quality, the Department of Justice, and the Tennessee Valley Authority.

¹²⁸ Memorandum from John H. Gibbons, Assistant to the President for Science and Technology, T. J. Glauthier, Associate Director, Office of Management and Budget, and Katie McGinty, Director, White House Office of Environmental Policy, November 24, 1993.

¹²⁹ Many SCS employees involved in flood recovery work, including James Reel, took advantage of the early retirement incentives offered in 1994. Karl Otte of the Watershed Projects Division took the buy-out in 1994. He left the Service in August. His duties were gradually taken over by George Bluhm. Another important leader in the flood recovery effort who left was Assistant Chief for the Midwest, John Peterson. He was replaced by Gary Margheim.

¹³⁰ These four model watersheds were used to examine the effect of various USDA programs on flooding, erosion, and sedimentation.



A farm near Hartsburg, Missouri, lies partially buried in sand. When farms like this do not recover, local government loses tax revenue and the local economy suffers. But who will bear the costs of flood prevention and recovery? Photo by Charles Rahm, SCS-Missouri.

The final report of the Interagency Committee, based on the expertise of the participants, field visits throughout the Midwest, and the SAST materials, was published in July of 1994.¹³¹ It may point the way to the future of floodplain management. Changes resulting from this report, in turn, could impact upon SCS's own work, especially the Small Watershed Program. The report stressed that the P.L. 566 projects provided flood prevention benefits at the local level. Thanks to the structural and non-structural measures implemented since the mid-1950's, flood damage was reduced by an estimated \$400 million. Water was held in small lakes and reservoirs, thus slowing the flow of water into the larger tributaries.¹³²

¹³¹ *Sharing the Challenge: Floodplain Management into the 21st Century, Report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force* (Washington: U.S. Government Printing Office, 1994).

¹³² For some specific details on the benefits of SCS small watershed projects, see the individual state sections, particularly Kansas.

The report also blamed increased flooding upon the loss of wetlands and upland cover. The Service's work in support of the Wetlands Reserve Program, the Emergency Wetlands Reserve Program, the Conservation Reserve Program, and the conservation compliance provisions of the 1985 FSA and 1990 Food, Agriculture, Conservation and Trade Act all contributed to limiting run-off. The report acknowledged, however, that the flood prevention effects of these upland treatment programs were local in nature.

Although economic development had been the touchstone of federal, state, and local water resources policy until the 1970's, the pendulum has swung toward environmental protection recently. The goal of the report was not to match the mistakes of the past with new excesses in a different direction.¹³³ Above all, the report and its recommendations were an attempt to balance economic and environmental needs.

As explained by Tom Wehri, SCS's representative on the Committee, both the final result, the report and its recommendations, and the process of investigation and discussion were valuable. Placing personnel from different and often competing organizations together to work on a common goal built relationships and understanding that may reduce friction in the future. Further, the variety of viewpoints on the Committee, the broad mandate supplied by the White House, the many meetings with individuals and groups in the flood areas, the comments of commercial agricultural and environmental groups, and congressional input all enabled officials to step back from the day-to-day rush of the flood response to consider larger, long-term policy issues.

Perhaps the most important question was not what to do about these issues--there have been plenty of studies on that--but rather how to negotiate the thicket of political, economic, regional, and bureaucratic rivalries in order to bring about substantive change in floodplain management. A key issue is whether or not there will be enough momentum to carry through on the reforms suggested by the committee, even as memory of the flood fades. Further, in light of the fact that so many levees and other structures were restored after the 1993 flood, it is possible that the impact of the policy changes that come from 1994's report will be most clearly felt after the next major flood.

¹³³ The comments on the draft Interagency Report in June and July of 1994, make clear that the report had taken the middle road in floodplain management debates. Personnel in USDA, Congressmen and Senators, levee and drainage districts, environmental groups, state farm bureaus, and individuals criticized aspects of the report. In general, the comments were of two types: first, that the recommendations did not do enough to protect the environment and mitigate flood dangers. Second, that following the recommendations in the report would result in undue hardship upon the economic health of the Midwest. Those taking the latter position often raised pointed questions about the perceived lack of mitigation efforts for those in earthquake- or hurricane-prone areas.

As David Galat, associate professor of fisheries and wildlife at the University of Missouri and participant in the SAST effort, told the *Kansas City Star*, "Everyone is talking about non-structural solutions. But all I see is everyone putting Humpty Dumpty back together again on the wall."¹³⁴

Another important outcome of environmental trends, budget constraints, and the immediate needs of the flood was a willingness to fund relocation away from the floodplain.¹³⁵ The ultimate goal was to reduce the amount of property requiring flood protection.¹³⁶ Here, too, SCS contributed its expertise. On September 12, a long opinion piece in the *Washington Post* by an advocate of relocating people outside the floodplains focused on the success of Soldiers Grove, a village of six hundred people in Wisconsin. The author wrote that relocation is cheaper than flood control in the long run and praised Secretary Espy's apparent willingness to at least consider this option.¹³⁷ At least in the short-term, it promised to be an expensive process. In early November, a FEMA official estimated that it would cost \$400 million to relocate those who wanted to move in 207 communities, but that funding was limited. The town of Valmeyer, Illinois, was expected to be among the first to move.¹³⁸ The American Institute of Architects, the American Planning Association, and the American Society of Landscape Architects held a competition to select a new town plan and design for Valmeyer. An SCS employee, Ed Weilbacher, was on the team which presented the winning design. Weilbacher, a Resource Conservation and Development (RC&D) Coordinator, made sure that important issues like erosion and sink holes were considered throughout the planning process.

The 1993 Midwest flood increased interest in floodplain management issues and accelerated long-term trends in this field. SCS experts participated in these discussions. In turn, these debates, both in the public sphere and within the government, influenced the Service's own work, as can be seen most clearly in policies involving levee repair and wetlands.

¹³⁴ James Kuhnhehn, "Levee Repairs Slowed," *Kansas City Star*, July 13, 1994.

¹³⁵ Relocation is the attempt to use government funds, primarily federal, to help entire communities move out of flood-prone areas. On December 3, President Clinton signed the "Hazard Mitigation and Relocation Assistance Act of 1993." This law was designed to increase the federal financial contribution for moving structures damaged by the flood.

¹³⁶ Nationally, from 1916 to 1985 the average number of flood-related deaths remained close to one hundred persons per year. However, per capita flood damages continually increased due to increasing numbers of structures in the flood plains. After adjusting for inflation, annual damages for the 1951 to 1985 period were 2.5 times greater than 1916-1950 annual damages. For more information, see "Chapter 4: History of Floodplain Management," in *Floodplain Management in the United States*.

¹³⁷ William Becker, "Noah's Architecture: Let's Not Rebuild on the Flood Plain," *Washington Post*, September 12, 1993.

¹³⁸ George Gunset, "Flood Relocation to Cost \$400 Million," *Chicago Tribune*, November 3, 1993.

Levee Policy

The levees built by federal, state, local, and private entities were and are vital to the economic health of the Midwest. They protect major cities like St. Louis, historic small towns like Hannibal, Missouri, and some of America's most productive farmland.¹³⁹ Yet, even today the overall number, size, and protection offered by these structures remains unclear since there was no central database before the 1993 flood.¹⁴⁰ Many structures are built and maintained by local government, drainage districts or private citizens. Creating a unified, comprehensive database was one of the goals of the SAST. In late 1993, the Corps had the most complete lists and maps, especially for the major river bottoms. The Service relied heavily upon its data.

The Army Corps of Engineers, as the most important single builder of flood control structures, was the focus of most levee repair discussions. The Corps and others involved in flood control often stressed the value of the property protected over the long-term by these structures. The Corps claimed its levees prevented \$250 billion in damage and had a 10:1 return on investment.¹⁴¹ The Corps paid one hundred percent of the repair costs for their own levees and eighty percent for levees with proper sponsorship which were maintained according to its standards. If a levee district wished to improve its levee, the Corps offered to provide seventy-five percent of those costs.¹⁴²

It is important to recognize that, like SCS, the Corps was caught between many contending forces. Environmentalists criticized the Corps for rebuilding levees with inadequate concern for environmental, especially wetlands, concerns. Farmers and landowners were equally vehement in their criticism that the Corps was not rebuilding enough levees or was not rebuilding them fast enough.

¹³⁹ As the 1994 report by the Interagency Floodplain Management Review Committee pointed out, "Corn yields in well-drained floodplains uniformly average 15 percent higher than the state average in Missouri." *A Blueprint for Change*, 46.

¹⁴⁰ "Chapter 12: Modifying Flooding," in *Floodplain Management in the United States*, 12-28. The Scientific Assessment and Strategy Team in Sioux City, South Dakota, made this one of their data collection tasks.

¹⁴¹ Stephen Labaton, "U.S. Weighs Scrapping Levees for Flood Control," *New York Times*, August 28, 1993.

¹⁴² Candice Bowman, "US Rain Impact: Flood Raises Many Issues Related to River Control," Knight-Ridder Financial News, August 12, 1993. See also Michael C. Robinson, "Nightmare in the Heartland: the Great Midwest Flood of 1993," *APIWA Reporter*, September 1993, 6-7. APWA is the American Public Works Association.



Levee break and "blue hole" along the Missouri River. Some holes were up to sixty feet deep. Material from the levee and hole washed onto the surrounding cropland. Photo by Charles Rahm, SCS-Missouri.

Traditionally, SCS has built relatively few levees and has played a minor role in flood control efforts along major rivers. It did, however, repair some levees under the EWP program. As a result, the Service was thrust into the contentious debate over the use of structural measures in flood control. Furthermore, criticism of larger and more prominent structural measures, such as those built by the Corps, could not help but have a ripple effect and raise questions about the Service's small watershed construction and EWP repair work.

Disagreements over the role of levees in increasing or controlling flooding are not new. For example, in 1920, the Weather Bureau weighed-in with its view: "It is probable that the levees constructed previous to 1871 from Cape Girardeau to Vicksburg had the effect of increasing the height of the flood plain in certain reaches of the river."¹⁴³ In 1947, writer Rufus Terral called levees along the Missouri River "self-defeating" because they constricted the river and thus raised the level of the water.¹⁴⁴ In 1993, many groups

¹⁴³ Samuel C. Emery, *Mississippi River Levees and Their Effect on River Stages During Flood Periods*, U.S. Department of Agriculture, Weather Bureau Bulletin No. 38 (Washington: Weather Bureau, 1910).

¹⁴⁴ Terral, *Missouri Valley*, 86-87.

used the flooding to attack the use of structural measures in flood control. For example, the Environmental Defense Fund (EDF) in New York issued "Key Issues in Targeting Areas for Not Rebuilding Levees." The EDF wrote that levee repair was not the best option when the levee had been substantially damaged, when the levee was in an area frequently flooded, or when restoration of the area would have "substantial environmental benefits." It also suggested that more data be gathered on floodplains, land use, and "prime environmental restoration areas."¹⁴⁵

Other observers with varying degrees of technical ability were more blunt. Essayist Andrei Codrescu wrote that "There is little doubt now that the mighty works of the Army Corps of Engineers to contain the river for new farms and growing cities has been a failure," and "The billions of dollars the floods cost will mean nothing if we don't learn the essential lesson: let the river take its course."¹⁴⁶

In response, experts from the Corps and other agencies tried to make clear again and again that levees, like all flood control structures, were built with the expectation that they would fail eventually.¹⁴⁷ Theoretically, the consequences of flooding, that is, the threat to life or property, determine the level of protection which is economically viable to provide. For example, an individual farmer may build a small levee which provides protection only to the five-year level. In others words, a five-year storm will almost overtop the levee. As determined by the farmer, the cost of building a higher levee is greater than the potential losses (generally crop damage) incurred from the occasional failure of that levee. Obviously, areas with valuable infrastructure or dwellings are protected by more substantial and expensive structures.

Others defended levees and stated that their negative effect upon flow levels was overstated. For example, a Corps engineer in St. Louis stressed that any rise in the water level due to levees was a local phenomenon. Also, this flood illustrated that the ability of floodplains to store water is limited. James Durkay, assistant director of civil

¹⁴⁵ Fax from the Environmental Defense Fund, September 9, 1993.

¹⁴⁶ Andrei Codrescu, "Down in the Flood," *Sierra* (March-April 1994): 86 and 91. See also Michael E. Diegel, "Mississippi Levee Blues," *Outdoor America* (Winter 1994): 8-10.

¹⁴⁷ As the Chief of Engineers stated before Congress in November, "there are a lot of different types of levees that are built to different standards and many of them were damaged. We shouldn't try to categorize them all in one swoop and say that they weren't designed properly. Probably the vast majority of levees, regardless of who built them, probably held up for the design for which they were intended." Statement of Dr. G. Edward Dickey, Acting Assistant Secretary of the Army for Civil Work, U.S. Department of the Army, Accompanied by Lieutenant General Arthur Williams, Chief of Engineers, in *Federal Response to the Midwest Floods of 1993*, 42.

works for the Corps, pointed out that although agricultural levees, which were built to provide a relatively low level of protection, failed upstream and the water filled the floodplain bluff to bluff, downstream areas still faced massive flooding.¹⁴⁸

Of the 275 levees the Corps built in the overall flood area, thirty-one were overrun, eight ruptured, and three were breached by floodwaters.¹⁴⁹ On the flood-affected parts of the Mississippi and Missouri rivers, there were 229 federally built and maintained levees, 258 non-federal levees that met the Corps' standards, and 1,091 levees that did not meet the standards. One paper estimated that only 110 of 465 damaged levees along the Missouri River were eligible for Corps assistance.¹⁵⁰ It is vital to remember, however, that levees vary greatly in length, the area they protect, and the level of protection they provide. The Corps repaired the largest levee systems which protected the most important infrastructure or towns and cities. On the other hand, many of the levees ruled ineligible for Corps assistance were smaller agricultural levees built and maintained by a single landowner.

Based on the enormity of the levee repair task, limited resources, and a long-term drive to systematize the levee system under its control, the Corps emphasized that it would not repair levees that were not in its Non-Federal Flood Control Works Inspection Program.¹⁵¹ As the Acting Assistant Secretary of the Army for Civil Works told Congress in November of 1993,

In 1986, the Corps recognized that we were expending substantial amounts of money on restoration of levees which were not properly maintained, or were not built to any particular design standard. So in 1986, we established a formal program where to be eligible for Corps of Engineers assistance under Public Law 84-99, a levee had to be built to a certain minimum design standard, had to be regularly inspected by the Corps to assure that it was regularly and properly maintained, and finally, that there was public sponsorship to ensure that if there was Federal assistance, that maintenance would continue in the future.¹⁵²

¹⁴⁸ James Denning, "When the Levee Breaks," *Civil Engineering* (January 1994), 39.

¹⁴⁹ Stephen Labaton, "U.S. Weighs Scrapping Levees for Flood Control," *New York Times*, August 28, 1993.

¹⁵⁰ Dan Looker, "A Clouded Future for Floodplain Farmers," *Successful Farming* (December 1993): 32-34.

¹⁵¹ See the U.S. Army Corps of Engineers, *Natural Disaster Procedures*, ER 500-1-1, March 11, 1991.

¹⁵² Statement of Dr. G. Edward Dickey, Acting Assistant Secretary of the Army for Civil Works, U.S. Department of the Army, Accompanied by Lieutenant General Arthur Williams, Chief of Engineers, in *Federal Response to the Midwest Floods of 1993*, 40-41. Public Law 84-99 authorizes the Corps to make emergency levee repairs.

In the late 1980's, the Corps had sent letters to many levee districts in the Midwest urging them to bring levees up to its standards and threatening to withhold emergency repairs otherwise. The response to these notifications was apparently less than overwhelming. Nevertheless, the Corps used the standards as a method of determining eligibility for post-flood levee repair.

Under great public and Congressional pressure, the Corps appeared to back off slightly by late September. First, the Corps announced that it would fix any levee built since 1986. Since few levees were constructed in the 1980's, this was not a major concession. Second, levee districts that did not receive adequate notice of Corps standards in the late 1980's could remain in the program. Scott Saunders, a spokesman for the Corps in Washington, stated that their policy had been set by Congress and the President.¹⁵³ There was, however, a great deal of debate over the intentions of Congress and the Administration. One major question became whether SCS, FEMA, or another federal entity could fund any levee repair turned down by the Corps. In the early stages of the disaster recovery effort, SCS generally avoided the issue since the water was usually too high to work in the larger river bottoms. With a few exceptions, the Service was repairing levees on small tributaries to the Missouri and Mississippi rivers that were clearly outside the Corps' jurisdiction.

Levee repair caused some of the most heated criticism of the federal government, particularly of the Corps, in the Midwest. As early as August 8, a *Des Moines Register* article stressed that farmers were dissatisfied with the Corps' work. They complained that the Corps focused too much on creating a nine-foot deep channel in the Mississippi and not enough on levee repair. Congressman Jim Ross Lightfoot of Iowa met with Lt. General Arthur Williams of the Corps, but said that he was unable to get any firm answers on future repair work. A levee district chairman also complained that the Corps was slow. He wanted the agricultural levees in his district raised. A Corps spokesman responded that many levees were not eligible for assistance.¹⁵⁴ In other news reports, farmers complained that environmentalists were setting the Corps' levee repair policy.¹⁵⁵ Public frustration grew over the pace of levee repairs. For example, the *Atlanta Constitution* reported on the complaints of landowners in Alexander County, Illinois, where a levee was breached on July 15. First, the levee was not in the Corps' program. Second, although SCS had said they would rebuild the levee, the Service was not sure when work could start.¹⁵⁶ In a move that did little to improve relations between the

¹⁵³ Lyle Graham, "Corps Refuses to Fix Some Levees," *Kansas City Star*, October 2, 1993.

¹⁵⁴ John Carlson, "Broken Levees Scar the Land," *Des Moines Register*, August 8, 1993.

¹⁵⁵ Bill Graham, "Effort to Restore Flood-Damaged Farmlands Expected," *Kansas City Star*, October 29, 1993.

¹⁵⁶ Phil Gast, "Frustration Still Runs High as Recovery Proceeds Slowly," *Atlanta Constitution*, October 26, 1993.

federal agencies, Des Moines Mayor John Dorrian complained publicly about the allegedly slow pace of repairs in his city. He compared the Corps' work to the faster pace of SCS and FEMA repairs.¹⁵⁷ Missouri congressmen urged President Clinton to reverse the Corps' levee repair policy.¹⁵⁸ They wanted more non-federal levees rebuilt.¹⁵⁹

On the other hand, some in the press came out in favor of the Corps and its policy of repairing only those levees that were part of its maintenance program. For example, a *Kansas City Star* editorial criticized the Missouri congressional delegation for trying to obtain more money for levee repair. The editorial emphasized two points: first, budgetary constraints made limiting spending vital; second, this was not the first time that people who had not purchased flood insurance received federal flood recovery aid. In the long-run, only by allowing the Corps to enforce its policy would levee districts be motivated to maintain levees properly.¹⁶⁰

Levee repair became tied to other aspects of long-term flood recovery. For example, one potential barrier to legislation increasing funding for buy-outs, that is, federally funded relocation of communities out of the floodplain, was that some Missouri representatives and senators wanted to add language to the bill which would force the Corps of Engineers to rebuild more levees.¹⁶¹ The attempt to hold relocation hostage to levee repair largely failed as only \$18 million was authorized for the Economic Development Administration (EDA) in November. The EDA was to use this money to

¹⁵⁷ The Corps responded that cold weather delayed work and that they did not expect the area behind the breached levee to be flooded again soon. Chris Osher, *Des Moines Register*, December, 21, 1993.

¹⁵⁸ James Worsham, "Missouri Lawmakers Ask Clinton to Lift Flood-Aid Restriction," *Kansas City Star*, October 15, 1993.

¹⁵⁹ Senator Christopher Bond of Missouri was the most prominent congressman pushing federal agencies to complete levee repairs quickly. The media noted that Bond's strong advocacy of federal help to repair more levees placed him in conflict with two unlikely allies--environmentalists and the Corps. In late 1994, the White House also opposed the Senator's proposal to force the Corps to repair levees it had ruled ineligible. Two other important pressures which helped increase support for more levee repair were the farm lobby and the potential public relations disaster if the Midwest were to suffer preventable flood damage in the spring of 1994. Robert L. Koenig, "Environmentalists and the Army Oppose Bond's Levee-Repair Push," *St. Louis Post Dispatch*, November 28, 1993. Senators and representatives from the flood area almost without exception publicly stressed the need for quick levee repair. For example, see the statements of Senators Charles E. Grassley of Iowa and Carol Moseley-Braun of Illinois in *Federal Response to the Midwest Floods of 1993*.

¹⁶⁰ "Get Backbone on Flood Aid," editorial, *Kansas City Star*, November 1, 1993.

¹⁶¹ James Worsham, "Federal Flood-Buyout Bill Advances," *Kansas City Star*, November 4, 1993.

repair levees outside the Corps program that were also ineligible for SCS assistance.¹⁶² The Administration contracted with the Corps to supply technical assistance for both determining eligibility and project design.

The Department of Agriculture attempted to find a middle ground in these debates. In a speech before the National Governor's Association, Secretary Espy stated that a White House Task Force was looking at floodplain management with an eye toward determining whether some levees should not be rebuilt.¹⁶³ He also discussed the option of buying towns that lie in the floodplain and expanding the Wetlands Reserve Program (WRP) at a flood relief conference in Des Moines on August 26.¹⁶⁴ Shortly after this statement, Espy reassured Midwesterners that levees protecting cities and farmland were going to be rebuilt.¹⁶⁵

SCS's own emergency work reflected the Secretary's middle-of-the-road approach. Although the Service was not a major builder of levees, it was obligated to repair eligible structures through the EWP program. SCS repair decisions were a function of EWP eligibility, financial constraints, White House policy, individual state conservationists, and the level of local cooperation with the Corps.

At a workshop on the EWP program in Kansas City, Missouri, in late July of 1993, the Corps and SCS seemed to reach an agreement based upon a 1986 Memorandum of Understanding (MOU) between the two agencies.¹⁶⁶ The Corps stressed the need to fulfill the MOU by enforcing consistent standards for sponsorship, cost-sharing, and maintenance. SCS was not to work on any levees on water courses with drainage areas over four hundred square miles (the same limit as for small watershed projects). All agreed that a one-stop center in each state for levee repair questions and requests was vital during the flood recovery process. These sites became the Disaster Field Offices (DFO's) where SCS, the Corps, and FEMA jointly received and considered requests for assistance. DFO's were established in the states with the most levee damage--Iowa, Illinois, Kansas, and Missouri.

¹⁶² Despite the efforts led by Senator Bond of Missouri, the Clinton administration requested and received only \$18 million, not \$150 million. These supplementary repairs were to be done under a 75-25 cost-share arrangement and to be built and maintained to the Corps' standards. See James Worsham, "Levee Repair Funds Fall Far Short of Missouri Plea," *Kansas City Star*, November 20, 1993.

¹⁶³ "Flood to Have Minimal Food Price Effect," Reuters wire service, August 16, 1993.

¹⁶⁴ Stephen Labaton, "U.S. Weighs Scrapping Levees for Flood Control," *New York Times*, August 28, 1993.

¹⁶⁵ "Alternatives to Rebuilding Levees Studied," *Washington Post*, August 27, 1993.

¹⁶⁶ This MOU was part of the Corps' overall effort to improve and standardize maintenance standards on levees during the late 1980's.



A contractor hired by SCS makes levee repairs along the Grand River in Missouri. Levee repair became one of the most contentious issues in the Emergency Watershed Protection efforts. Photo by Charles Rahm, SCS-Missouri.

Events would show that the degree of SCS-Corps cooperation varied from state to state. The problem centered around interpretation of the 1986 MOU and whether the Service could repair levees ineligible for the Corps' program. One issue was whether the Memorandum of Understanding had ever been implemented, since there had been little or no contact between the agencies concerning levees or their repair after the signing. Time and again, SCS personnel stated that the statutory requirements of the law that authorized the EWP program (the Agricultural Credit Act of 1978) did not contain a provision for SCS to refuse to rebuild a levee based on previous maintenance standards or the Corps' objections.¹⁶⁷

Despite these concerns, a wide range of efforts at interagency cooperation met with success. On August 5, SCS, Corps, and FEMA held a meeting in Moline, Illinois, in order to coordinate the repair of levees. Meetings were also scheduled for August 6 in Davenport, Iowa, and Earth City, Missouri. The Interagency Levee Rehab Task Force met in Earth City, Missouri, on August 19. The SCS representative with the group,

¹⁶⁷ Each state's experience with levee repair is recounted in more detail in separate sections.

Tom Wehri, reiterated great concern that the Corps' restrictions on levee repair would put the Service in an untenable political and legal position. There was still time for these debates during the summer of 1993 as the amount of levee repair work was minimal because of high standing water, especially in Missouri. EWP efforts focused on debris removal and streambank stabilization along tributaries.

The staff of the Soil Conservation Service struggled to balance many of the same financial, legal, and political pressures as the Corps did. Many members of Congress expected levees in their districts to be repaired immediately, while environmental groups like the Izaak Walton League urged a slower approach that looked at floodplain management and emphasized environmental values. Specifically, some elected officials were angry that the expansion of wetlands appeared to be a higher priority than the repair of levees. These conflicts put SCS, which was involved in both programs, in a difficult position. At a public flood recovery meeting in late October, Governor Terry Branstad of Iowa exclaimed, "Is it the policy of the federal government to make the whole goddamn upper Midwest a wetland?"¹⁶⁸ He wanted funds released immediately for levee repair to prevent spring flooding. Jeff Vonk, state conservationist in Iowa, pointed out that the estimated costs of repair requests far exceeded available funds. SCS in Iowa had received 895 flood damage reports to repair \$27.6 million in damages. At that time, the Service was making many EWP repairs and had not even finalized rules for the emergency wetlands program.

These pressures were felt by the Service in Washington. At an August 24 meeting in Karl Otte's office, discussion focused on levee repair, relations with the Corps, and related environmental concerns. Some at the meeting stressed that the process of levee repair needed to be systematized. They were concerned that SCS, with fewer employees than the Corps, was running itself ragged by attending meeting after meeting on levee repair without reaching any consensus. SCS hoped to rely on a system of three classes of levees, developed as part of its Small Watershed Program, to set priorities for repairs.¹⁶⁹ Almost all or all Class I levees would be replaced, since they were built to

¹⁶⁸ Jonathan Roos, "Governor Curses in Flood Aid Talks," *Des Moines Register*, October 29, 1993.

¹⁶⁹ According to the *National Handbook of Conservation Practices*, the three classes are defined as follows:

- Class I dikes are those constructed on sites where...Failure may cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, main highways or railroads, and high value land, crops or other improvements. Protection was required to contain over twelve feet of water above the normal ground surface.
- Class II dikes are those constructed in highly developed and productive agricultural areas... Failure may damage isolated homes, highways or minor railroads, causing interruption in service of relatively important public utilities. The maximum level of protection is twelve feet of water.

protect life and property. Most of the Class II levees would be replaced also. Class III levees would require extensive input from FWS and EPA before any action would be taken. These classifications, however, had not been completed in the field.

Many discussions about the advisability of rebuilding levees took place within the White House and federal agencies. In late August a memo from T. J. Glauthier, Associate Director, Natural Resources, Energy and Science, OMB, and Kathleen McGinty, Director, White House Office on Environmental Policy, laid out the general procedures for levee repair. The memo was based on meetings at the White House attended by SCS, EPA, the Corps, and FEMA. The Watershed Projects Division sent its own expert, usually Karl Otte, to attend these discussions. First, the memo ordered that federal agencies consider alternatives to rebuilding levees and other flood control structures. Second, FEMA's Disaster Field Offices (DFO's) were to be the focal points for repair requests in each state. Third, state and federal agencies would have twenty-four hours to comment on levee repair project proposals. Finally, federal agencies were to make monthly reports to the Office of Management and Budget (OMB) on repair applications received, comments received, and actions taken.¹⁷⁰ The White House memo on levees was forwarded to SCS state offices in the Midwest.

The August 24 White House directive also gave the Department of Transportation, the Environmental Protection Agency, and other federal agencies the right to review levee repair plans submitted to the DFO's in each state. Some SCS staff expressed concern that the Department of Transportation and the Environmental Protection Agency, organizations with relatively little experience in water resources issues, would hold frequent meetings, increase their role in the evaluation of levee repairs, and thus slow EWP work. For two reasons, this did not become a serious problem. First, SCS tried to consider a wide variety of factors, including environmental, in the initial planning stages of each project.¹⁷¹ SCS construction plans anticipated environmental concerns and were prepared accordingly. Second, many federal agencies lacked the field staff or technical expertise to evaluate levee repair requests. The FWS provided much of the guidance or suggestions on structural repair work. The agency's experience in areas such as wetlands and its relatively large presence in rural areas enabled it to participate in the process.

- Class III dikes are those constructed in rural or agricultural areas where...Damage likely to occur from dike failure is minimal. The levee must be designed to hold back six feet of water in mineral soils and four feet in organic soils.

¹⁷⁰ T. J. Glauthier and Katie McGinty memorandum to various federal agencies, August 23, 1993.

¹⁷¹ See the section on Illinois for details on one approach to this problem.

Following their visit to Iowa, Missouri, and Illinois in early September, the Interagency Levee Rehabilitation Task Force wrote several draft memos with suggestions on improving management of the DFO's. First, the twenty-four hour comment period on project reports was deemed inadequate. They suggested that when SCS, the Corps, or FEMA received a levee repair request, they immediately notify other members of the team. This arrangement would allow about two weeks for comments while SCS or the Corps conducted site visits and wrote project reports. One of the memos also detailed a dispute over levee repair in Illinois and Iowa. SCS personnel in both states emphasized that their legislative authority did not allow them to follow rigidly the 1986 MOU with the Corps and that they must repair levees eligible for EWP assistance when requested. Finally, the memos reemphasized the need for DFO's to make nonstructural alternatives clear to those requesting assistance.

The White House clearly sought to link levee repair and wetlands policies. In order to implement the August 24 White House directive on the need to provide non-structural alternatives to levee repair, the White House requested that SCS supply detailed information on alternatives to levees, such as the Small Watershed Program, Wetlands Reserve Program, and the Conservation Reserve Program. The Service supplied this data. Staff in the Watershed Projects Division also stated that their goal was to develop a plan for an emergency wetlands reserve program by Friday, August 28.

Although much time and energy were devoted to discussions of providing alternatives to levees in late 1993, there were actually few viable options available. The sign-up for the pilot WRP had been completed and ASCS was no longer accepting bids from landowners. Although the August flood relief bill provided funds for easement purchases in the wetlands program, there were no rules to carry out this activity until November of 1993. Further, much of the land inundated in 1993 did not meet wetlands criteria. This was true for those areas far from the river which were flooded for the first time in memory and areas in the river bottoms now covered with several feet of sand. Other than FEMA, which assisted a few communities that were able to organize quickly to relocate out of the floodplain, no other federal agencies were even able to offer farmers viable nonstructural alternatives to levee repair in 1993.

It is also important to bear in mind that many levee repair decisions were straightforward--they were economically defensible, protected valuable cropland or infrastructure, had proper sponsorship, and little or no adverse impact upon the environment. Therefore, there was little incentive for many Midwesterners to delay repairs in order to consider an alternative.

In the field, the progress of levee repair work at least partially reflected the Service's organizational structure, which gave each state conservationist a great deal of authority. Each state took a slightly different approach. In late 1993, Iowa was declining few requests, Missouri was generally following the Corps' lead, and Illinois was treading a path roughly in the middle. National headquarters staff explained the initial variation among the states. State conservationist Russ Mills had long experience with levees in Missouri and had seen some wiped out four or more times. This experience has made him more willing to reach agreements with the Corps and limit the number of levee repairs. Mills had no intention of doing any work in the 100-year floodplain of the Mississippi or Missouri rivers. On the other hand, Jeff Vonk, state conservationist in Iowa, was newer to his state and was more willing to rebuild structures. There was a gradual convergence of levee repair policies over the fall of 1993. By the spring of 1994, there were few differences between the states.

Shortly before Thanksgiving, the White House presented the next iteration of its long-term levee repair policy. Within each state, SCS and the Corps were to determine the geographical areas of their work. Based on the 1986 agreement between the two agencies, SCS would generally handle repairs for levees on waterways with a drainage area of less than four hundred square miles, though work in other areas was possible. The Service would not fund any work in areas under Corps jurisdiction. Levee work was to be prioritized based on factors such as the type of property protected, the record of maintenance by the levee sponsors, and the environmental impact of the repair. Shortly after this approach was transmitted to the states, winter weather began to halt repair work. Developments during early 1994 led to further modifications to the criteria for which levees SCS would or would not repair under its EWP program.

Pressure for more and faster levee repair increased in early 1994. The American Farm Bureau Federation stated several reasons why these repairs were needed quickly: 1) to protect farm income, 2) to preserve property values, and 3) to prevent future flooding.¹⁷² Many of the complaints voiced through the press focused on the perception that the Corps was repairing too few levees too slowly. The Corps responded that there were often complicated disputes with levee districts or other sponsors over repairs. For example, the Engineers may find that it is more cost-effective to build around the edge of a major scour hole. On the other hand, the levee district members may want to restore as much cropland as possible by filling in the hole and rebuilding the levee in the exact position it was before the flood, a more expensive option.¹⁷³

¹⁷² "Failure to Rebuild Levees May Spur Flooding, Group Says," Knight-Ridder News Service, March 8, 1994.

¹⁷³ See Pringle Pipkin, "Floods Menace Battered Lands," *Kansas City Star*, April 13, 1994, and Sharon Cohen, "Living Without Levees: Pushing Paper, but Not Much Dirt," AP wire, April 16, 1994.

In 1994, it became increasingly clear that more levees were going to be repaired than most outside observers and government personnel had expected back in the summer and autumn of 1993. The supplemental appropriation of early 1994 provided money for regular EWP work and the wetlands program. The relief bill also gave \$50 million to the Service to repair levees that had been rejected in 1993 by the Corps or SCS. These funds were to repair large agricultural levees with over four hundred square miles of drainage, thus negating the 1986 agreement between SCS and the Corps. This appropriation, along with a smaller amount of money (\$18 million) given to EDA in late 1993, represented another shift in the federal policy on levee repair.

At the Kansas City flood recovery meeting in mid-March of 1994, the SCS stated that it planned to repair additional levees on the condition that the sponsors place these rehabilitated structures into the Corps' program. The Corps would then assume responsibility for enforcing standards and would make repairs after natural disasters in the future under their levee program. The Soil Conservation Service, FEMA, and Corps personnel met to discuss this criteria. Ed Hecker of the Corps said that they had rejected levee repairs for two main reasons: lack of proper sponsorship and lack of proper maintenance. The Corps and OMB were eager to see SCS repair only levees that had sponsorship problems, not those levee systems with maintenance deficiencies.¹⁷⁴ According to the EWP program rules, SCS could restore a levee to pre-flood conditions only. Therefore, if the levee had been ineligible for the Corps' program due to design or severe maintenance problems prior to the flood, then it would remain outside the program after repairs. Almost all present at the Kansas City meeting stated that the four hundred square mile limit on SCS repair work, which was based upon guidelines for the P.L. 566 program, was arbitrary and need not be followed for these levee repair jobs.

Although the details of the "hand-off" of these levees from SCS to the Corps were not worked out completely, both agencies took steps toward building a long-term plan to get levees into the Corps' maintenance program. The sponsor had to be informed that the alternative to entering the program after SCS completed its repairs was to be without protection or the promise of repair if another major flood occurred. One major concern was whether levee districts were willing and able to fund the improvements needed to bring their structures up to the Corps' standards.¹⁷⁵

¹⁷⁴ OMB personnel tended to agree with the Corps' stand on this issue. The law itself, however, did not make this distinction. SCS looked at the failed amendment to the relief bill sponsored by Representative Pat Donner of Missouri, which did contain this provision.

¹⁷⁵ Under the EWP program rules, the SCS may return structures to pre-flood conditions only, not improve them. Again, that condition may not meet Corps' standards.

Some SCS staff expressed skepticism at the attempt to create rigid, long-term rules for which levees the Service or the Corps would repair. They pointed out that despite the decisions by the Corps not to repair many levees and the lobbying of the environmental community, when Congressmen wanted something repaired, it generally got done. Congress had essentially overridden the Army and SCS levee repair criteria with its \$50 million supplemental appropriation. What was to stop this from happening after the next major flood?

The Service's supplemental levee repair criteria was finalized with OMB approval in early April. The following criteria for repairing levees with over four hundred square miles of drainage were then distributed to the nine flood states:

1. The primary beneficiary must be agriculture or related businesses.
2. Levee is not currently in the Corps' program.
3. Levee owner agrees to enter the Corps' program within two years of repairs. Preference will be given to levees most likely to become eligible for the program after repairs.
4. Levee owner must supply twenty-five percent of repair costs and five percent of the costs must be in cash.¹⁷⁶
5. EWRP will be offered as an alternative when possible. Repairs must be environmentally and economically defensible.
6. No repairs would be made on the river side of the main levee.¹⁷⁷
7. All project agreements for repairs will be complete by the end of 1994.

One of the last major levee repair meetings between SCS and the Corps was held in St. Louis in mid-April of 1994. At this meeting, these two agencies, along with the EDA, exchanged information on the status of their repair efforts. Also present at the meeting were representatives from the White House and the Secretary of Agriculture's flood liaisons from Missouri and Illinois. These men and women all emphasized the need to

¹⁷⁶ The five percent cash requirement was added by OMB at the urging of the Corps. SCS, which often obtained the entire twenty-five percent of the sponsors' cost-share contribution in services or materials instead of money, objected but was overridden. Since SCS in Iowa attempted to manage its EWP effort along the model of a grant program (see the Iowa section which follows), the cash requirement represented a significant barrier to sponsors. See also the comments of Steve Knorr, an aide to Senator Kit Bond of Missouri: "We believe that there are levee districts out there that meet SCS guidelines, but because the administration is forcing the SCS to use Army Corps of Engineers guidelines, only roughly \$4 million has been spent in the entire Midwest." James Kuhnhehn, "Levee Repairs Slowed," *Kansas City Star*, July 13, 1994.

¹⁷⁷ A main levee is usually defined as the levee which supplies the highest level of protection. This is not necessarily the levee closest to the river. Often, after the Corps or a levee district built a main levee set-back some distance from the river, an individual farmer constructed a smaller levee right next to the river in order to maximize the area he can farm.

make firm levee repair decisions as quickly as possible. The Service was eager to find out which projects EDA was funding. A great deal of time was spent discussing how to transfer levees repaired by SCS under the 1994 supplemental appropriation into the Corps program. The Corps stressed that it wanted to create a common policy among all federal agencies. In light of the Corps' lack of popularity in much of the Midwest and the fact that SCS was only involved in temporary levee repair work, many in the Service were not eager to be tied to the Department of the Army's program.

SCS staff were concerned that the public was getting the impression that the Service would repair any levee rejected by EDA, the Corps, or anyone else. In fact, assistant state conservationists from Illinois, Iowa, Kansas, and Missouri did not expect to spend more than a small portion of the \$50 million made available in the supplemental appropriation. There were several reasons that the number of levees eligible for this emergency repair program was small. First, many levee districts balked at the requirement that they bring their levees up to Corps standards and enter its program within two years of SCS repairs. Second, many levees were built by and benefited a single landowner; therefore, there was no public benefit to repairing them. Third, other levees lacked proper sponsorship. Fourth, a few did not meet economic criteria. Gary Parker of Illinois, Lyle Asell of Iowa and Mike Wells of Missouri each said they would be repairing a few more levees. James Wallace, chief engineer in Kansas, stated that his office had received seventy-four requests for repairs. The vast majority of these, however, would not be eligible for assistance.¹⁷⁸

Looking back from the summer of 1994, it is clear that levee repair was a relatively minor part of EWP work that took up an inordinate amount of time and effort. This was a function of the complicated politics of floodplain management, which focused on the advisability of repairing levees. A related factor was the bureaucratic competition between agencies, mainly SCS and the Corps. The rivalry had its long-term basis in differing approaches to flood control or flood prevention. These traditional tensions were heightened by the desire of all agencies to prove their worth to the new presidential administration, as well as the inevitable personal conflicts. Further, policies or approaches to flood recovery work varied not only between, but also within agencies. The pressure to make repairs would have been even greater except for the continued presence of standing water in the floodplain which delayed damage survey and emergency work in late 1993.

¹⁷⁸ One reason for the great variation in the number of requests for assistance is that some states tended to count a "request" for assistance only if it had a good chance of being approved and completed. Others let almost anyone make a request.



Most levee breaks were not like the spectacular events which dominated the network news. Here, in a more typical scene, water pours through a break in a levee along Little Canteen Creek near Belleville, Illinois. Photo from SCS-Illinois.

Two related factors which have received insufficient attention are the different organizational structures and cultures of each agency. SCS places a great deal of responsibility for decision-making at the state and conservation district level. Although there are four National Technical Centers, each serving a different region of the country, lines of authority generally run from Washington to the individual states. Further, the Service has long prided itself on its close ties to the communities it serves through a system of field offices. SCS personnel also tend to come from agricultural backgrounds or areas where commercial agriculture is important.

The Corps is different in several significant ways. First, it is organized into divisions which are generally based upon the drainage areas of major rivers. Each encompasses several states or parts of several states. These divisions are further divided into districts. One state can be part of several districts. Iowa is divided between two divisions (Missouri River and North Central) each with two districts in part of the state. From the

Corps' perspective, SCS relies on arbitrary political divisions between states. Second, the Corps' organization is more centralized and hierarchical than most agencies, probably due to its military heritage and the personnel. These different structures and approaches hampered coordination.¹⁷⁹

Another factor which made the development of a uniform approach to levee repair difficult was the great variation among states in their own floodplain management laws. As pointed out in the Interagency Floodplain Management Task Force Report, Illinois has twenty-two full-time persons working on floodplain management while Missouri has none. Wisconsin has an extensive state program for mapping floodplain areas while South Dakota does not. While Illinois and Iowa directly regulate floodways with standards that exceed those of the National Flood Insurance Program, the other flood states either set standards for local regulations or have no significant rules. The same variation is seen in state regulations for special flood hazards, such as areas above or below dams, and programs for redevelopment, two areas where Minnesota is a leader. Variations in SCS's own EWP policies must be seen in the context of the different levels of state interest and expertise in the field of floodplain management.

The final report of the Interagency Task Force staked out a position in the middle of the levee repair debate, stressing that these structures did not cause the 1993 floods. The report admitted, however, that levees may have had a significant local effect upon flood stages and suggested that many levees should be either repositioned or abandoned. Reflecting the dominate position of the Corps as the most important single builder and maintainer of levees, and source of information for much of the report, the Task Force suggested that the Corps become the principal federal levee construction and repair agency. Further, the report supported the Corps' levee repair policy and standards and criticized the supplemental levee funding from Congress in early 1994 because it may "send the wrong message to levee sponsors" and not encourage proper maintenance. Within the ranks of SCS, there were few objections to these proposals, as long as they were made clear to the public, and the Corps shouldered the financial and political costs of their policy.

¹⁷⁹ To add to the confusion, the flood areas of the Midwest contained parts of three FEMA regions (region V-Chicago, VII-Kansas City, and VIII-Denver).

Wetlands Policy

The development of wetlands policies in 1993 and 1994 grew out of long-term trends like increasing interest in protecting the environment. It also stemmed from more recent stress on wetlands as a sensitive political issue, and the intense pressure from the media, the public, interest groups, and the government to respond quickly to the Midwest flood and limit future flood recovery costs.¹⁸⁰ Also, the purchase of wetlands easements was seen as a way to help devastated farmers whose land could not be restored to productive agriculture at a reasonable cost.

The federal role in protecting wetlands has expanded steadily over the past two decades. The Water Bank Act of 1970 provided payments to farmers for protecting wetlands used as breeding and nesting areas for migratory waterfowl. The next important step in wetlands legislation was the Clean Water Act of 1972. Court interpretations of Section 404 of this Act expanded the Corps of Engineers' jurisdiction to all waters in the United States, including wetlands. A "404" permit is now required for the discharge of dredged or fill materials into waters. EPA may also restrict discharges that have adverse impacts upon wildlife or water supply. The Food Security Act of 1985 was another advance. Its "swampbuster" provisions linked protection of wetlands to farm subsidies from the Department of Agriculture. The Emergency Wetlands Resources Act of 1986 increased the role of the Department of Interior's Fish and Wildlife Service in monitoring wetlands resources.

The most contentious aspect of the program has been the criteria for wetlands delineations--this would determine the lands that fell under the scope of the program. The issue was deferred by the Bush administration in 1992 when it charged a committee under the auspices of the National Academy of Sciences with developing uniform criteria for all federal agencies. Meanwhile, the Corps of Engineers' 1987 standards were used.¹⁸¹ A related issue was the willingness of President George Bush to follow through on his promise for "no net loss" of wetlands in America during his ill-fated re-election bid.

¹⁸⁰ According to the 1994 Interagency Floodplain Management Review Committee report's glossary, wetlands are "Those areas that are inundated by surface or ground water with a frequency sufficient to support and, under normal circumstances, does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wetlands generally include bottom land hardwoods, swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflow, mud flats, and natural ponds."

¹⁸¹ For an overview of how wetlands are defined and their benefits to wildlife, see Jon A. Kusler, William J. Mitsch, and Joseph S. Larson, "Wetlands," *Scientific American* (January 1994): 64-70.



Wetlands in Minnesota. SCS photo file.

The Wetlands Reserve Program (WRP) was the basis for the Emergency Wetlands Reserve Program implemented by the Service after the 1993 flood. The original goal of the WRP was to take cropland that had formerly been or was currently wetlands out of agricultural commodity production by purchasing permanent easements and paying seventy-five percent of the costs of restoring the wetlands values at the site. The program has important environmental benefits: improved water quality, increased wildlife habitat, and flood damage abatement.

The WRP was authorized in the Food, Agriculture, Conservation, and Trade Act of 1990. However, it was not until the fiscal year 1992 appropriations bill that funds were provided to enroll up to fifty thousand acres. WRP became a nine-state pilot program managed by ASCS with SCS and FWS assistance.¹⁸² The Service's main roles were to make wetlands determinations, help develop criteria for bid rankings, and provide technical assistance on wetlands restoration. ASCS oversaw the appraisal process, ranked bids, and handled the purchase of easements. Although farmers began to sign up for the program in June of 1992, it was not until January of 1993 that the extensive

¹⁸² California, Iowa, Louisiana, Minnesota, Mississippi, Missouri, New York, North Carolina, and Wisconsin. Note that four of these were among the nine flooded states.

bidding and evaluating process was complete and 49,888 acres were tentatively accepted. The average cost per acre was \$923 (\$742 for the easement, \$52 for cost-share payments for restoration, \$124 for SCS technical assistance, and \$4 for appraisal fees).

The American Farmland Trust and the Soil and Water Conservation Society each provided their own evaluations of the WRP and found weaknesses in several key areas. First, almost twenty percent of farmers whose bids had been accepted by ASCS changed their minds. Therefore, ASCS had to go back to landowners it had rejected previously. Second, the lack of an open procedure for ranking and selecting wetlands deterred many from joining. Landowners wanted decisions to be made at the state or local level rather than in Washington. Third, many did not like the permanent nature of the easements. Finally, some landowners preferred to sell title to the land outright rather than sell the easement and lose almost all productive use of the land while retaining tax liability. SCS staff was aware of these problems and tried to develop the EWRP program accordingly.

SCS staff drew several other conclusions from the pilot program that would influence the emergency program in 1993 and 1994. First, the period between the farmer's first inquiries and the final purchase of the easement was too long. Second, the process of bids and evaluations, which wound its way from the local level all the way to Washington, was too complicated. Nevertheless, there was great potential for the program. The easements purchased under the pilot program represented only about twenty percent of the total acreage offered by landowners.¹⁸³

In 1993 and 1994 attention re-focused on wetlands and one particular question: would more wetlands in the floodplains have reduced the severity of the Midwest flood? The *Chicago Tribune* published an article concerning the wetlands program which quoted ASCS official Jack Webb, "the Agriculture Department official responsible for coordinating the Wetlands Reserve Program," as stating that the floods would not have been as extensive if adequate wetlands had been in place. He blamed flood control structures for increasing flood damage by constricting the river.¹⁸⁴ Another *Chicago Tribune* essay by a representative of the World Wildlife Fund (WWF) claimed that wetlands reduce flood peaks. The author said that the FWS agreed with WWF on the importance of wetlands. In conclusion, the author advocated restoration through the Wetlands Reserve Program.¹⁸⁵ United Press International interviewed a member of the

¹⁸³ For more detail on the pilot program, see "1992 Wetlands Reserve Program: Report to Congress," Agricultural Stabilization and Conservation Service, February 1993.

¹⁸⁴ Michael A. Lev, "In Flood's Wake, Wetlands Idea Surfaces Again," *Chicago Tribune*, August 1, 1993.

¹⁸⁵ Constance Hunt, "Returning the Wetlands to the Water," *Chicago Tribune*, July 31, 1993.

Committee on Wetlands Characterization, which will issue a scientific definition of wetlands by September 30, 1994. He stated that most of the wetlands lost each year disappear because of agriculture and development in the upper Mississippi region and posited that the floods would have been less severe had there been more wetlands.¹⁸⁶ The increasing influence of opinions such as these was clear in 1993. By lessening future floods and moving infrastructure out of the floodplains, wetlands were seen as a way to reduce future damage and relief payments. Thus, a budgetary justification was offered for increasing the amount of wetlands in the floodplains.

Some experts pointed out that the 1993 flood was a uniquely large event that filled many floodplains from bluff to bluff. Thus, it was unfair to use it as a measurement of the effectiveness of levees or wetlands in flood control. A Corps of Engineers expert stated that, "On a flood like we had last year, it [wetlands] will have no effect. Wetlands are important, but not for flood reduction."¹⁸⁷ Overall, this viewpoint was in the minority.

Environmental groups, the scientific community, Congress, commercial agriculture, the White House, and USDA each played a role in influencing wetlands policy. In mid-July Chairman of the Senate Agriculture Committee, Patrick Leahy of Vermont (D), suggested that the WRP be expanded. The Senator stressed the long-term savings in disaster relief payments that could result from more wetlands.¹⁸⁸ In his July 29 request for additional flood relief funds, the President introduced the option of the wetlands reserve as an alternative to levee repair.¹⁸⁹ The President's proposal also stated that if the Secretary of the Army determined that the cost of the repair exceeded the economic benefits, he could transfer funds to the Secretary of Agriculture to enroll the land in the wetlands program. This provision did not make it into either the House or the Senate versions of the emergency flood relief bill. The \$60 million allocated to the Service in the August relief bill authorized the purchase of permanent easements on wetlands which had been inundated in the 1993 flood if the cost of levee repair and/or cropland restoration exceeded the value of the land.

The immediate pressures of flood recovery and the long-term development of a wetlands policy merged in late August. On August 24 the White House Office on Environmental Policy, under Director Kathleen McGinty, announced a new federal wetlands policy, based on talks among an interagency group of nine federal organizations (including the Service), farmers, environmentalists, scientists, and Congress. Highlights included: 1)

¹⁸⁶ "Scientists Define What Is a Wetland," UPI newswire, September 8, 1993.

¹⁸⁷ Peter Annin, "To the River, the Spoils," *Newsweek*, (April 11, 1994): 71.

¹⁸⁸ "Senator Leahy on Mississippi River Flooding and Disaster Relief," *FWN*, July 16, 1993.

¹⁸⁹ Letter from President William Clinton to the President of the Senate, July 29, 1993, with enclosures.

continued use of the 1987 wetlands delineation until completion of the National Academy of Sciences study in September of 1994, 2) SCS designated as the lead agency for wetlands determinations for agricultural lands, and 3) Alaskan wetlands added to the program.¹⁹⁰

In a separate press release on the same day, the Office of Environmental Policy set forth five general principles of the Clinton administration's wetlands policy:

1. No net loss is a short-term goal; increasing quality and quantity of wetlands is a long-term goal.
2. Regulatory programs must be clearer.
3. Public-private cooperative efforts are needed to reduce reliance on regulation.
4. A partnership is needed with state, tribal, and local governments.
5. Wetlands policy should be based on the best scientific information available.

The White House announced that an Executive Order to implement these principles would be issued. The President reassured agricultural interests that the approximately fifty-three million acres of prior-converted cropland would not be affected.¹⁹¹

The Clinton administration's wetlands policy proved slightly less controversial than Bush's had been. Some farmers were angry over the wetlands policy because it kept prairie potholes in the plains under federal protection. Others praised the plan for simplifying the regulation of wetlands on agricultural lands by clearly putting the Soil Conservation Service in charge.¹⁹² The Service was criticized by some for its wetlands policies. Some editorials and articles questioned whether SCS could be trusted to carry out wetlands protection or any program that did not have the strong support of commercial agriculture. For example, a *Baltimore Sun* editorial generally praised the Clinton administration's wetlands policy as evenhanded. However, the *Sun* noted that

¹⁹⁰ See the White House Office of Environmental Policy press release, July 24, 1993. This statement was formalized with a Memorandum of Agreement signed by representatives of SCS, the Corps, FWS, and EPA on January 10, 1994.

¹⁹¹ See the White House Office of Environmental Policy press release, July 24, 1993.

¹⁹² "Clinton Rejects Farmed Wetlands Exemption," *The Forum*, August 25, 1993. For one horror story detailing the danger of too many agencies involved with wetlands on agricultural lands, see Marcia Zarley Taylor, "Tale of a Wetlands Hostage," *Top Producer* (April 1994): 16-17. In this article, a California farmer spent \$150,000 disputing faulty wetlands determinations made by the Corps of Engineers and FWS.

enforcement of the wetlands rule for farmers will be left to the Agriculture Department, whose traditional role of promoter rather than regulator is suspect. Doubters need only look at the agency's weak hand in curbing water pollution by farm pesticides and fertilizers.¹⁹³

The Fayetteville, North Carolina, *Observer-Times* discussed the Clinton administration's wetlands program. It echoed other reports: farmers welcomed the plan while environmental groups criticized the role of SCS. A scientist with the Environmental Defense Fund in Raleigh said, "The scuttlebutt is that the Soil Conservation Service has never seen a farm field it considered wet."¹⁹⁴ The Service's policy was an attempt to balance the often contradictory interests of the environmental community and commercial agriculture.

At a meeting of SCS Washington staff involved with the wetlands issue on August 25, it was decided to approach ASCS with a draft policy that would accelerate the Wetlands Reserve Program. The Service's primary goal was to create a more streamlined process so that farmers could decide in the fall of 1993 whether they needed to prepare to plant in waterlogged fields in the spring of 1994. The goal was to complete a plan within one week. It was decided quickly that the SCS Acting Chief, Galen Bridge, should speak with the head of ASCS in order to promote interagency cooperation.

Developing a wetlands program to respond to the immediate needs of flood victims became a long and frustrating process. The Fish and Wildlife Service, which played a major role through its National Wetlands Inventory, was enthusiastic over the possibility of a streamlined program, as was EPA. On the other hand, ASCS did not want SCS to significantly modify the WRP rules. The sticking point was the method of determining the easement value. ASCS legal experts said that an appraisal was required for each easement. They claimed that the best method to decide this value was to use the post-flood appraised value plus a small "add-on." They also wanted to continue to follow the relatively slow bidding and ranking process used by ASCS. These procedures would have led to very low easement values--so low that landowners would have opted for assistance to repair structures or restore cropland. Alternatively, the federal government could have been perceived as attempting to take advantage of people in distress in order to buy easements at "fire sale" prices.

¹⁹³ "Balancing Act in the Wetlands," *The Baltimore Sun*, September 19, 1993.

¹⁹⁴ "Farmers Welcome Easing of Rule on Wetlands," *Fayetteville Observer-Times*, August 27, 1993.



Severely scoured cropland along the Missouri River. The Service worked with landowners to help them determine the best method to restore their cropland or to place their land into the Emergency Wetlands Reserve Program. Photo by Norm Klopfenstein, SCS-Missouri.

One of the difficulties in forming a new policy stemmed from the plans to reorganize the Department of Agriculture, which were announced publicly in early September of 1993 by Secretary Espy even as the dispute with ASCS over wetlands policy was heating up. This initiative, part of Vice President Gore's Re-inventing Government effort, was designed to streamline the department by abolishing redundant administrative services. Specifically, the National Performance Review Team report, supported by Secretary Espy, called for the creation of a Natural Resources Conservation Service made up of SCS and ASCS's cost-share programs. Other ASCS programs were to be placed into a Farm Service Agency. The possible "survival" of SCS and the dismembering of ASCS led to tensions and concerns that delayed interagency cooperation on the emergency wetlands program.

Early September was an important period in the complicated development of what became known as the Emergency Wetlands Reserve Program. All were eager to begin work in the field--making wetlands determination and drawing up restoration plans--while weather permitted. At a September 7 meeting in Karl Otte's office, Don Butz,

Land Program Manager with the Land Branch, stated that he thought ASCS and SCS were very close to agreeing on a cooperative program along the lines of the WRP. Discussion centered on the intent of Congress--did lawmakers expect the regular WRP program rules to be followed exactly? Billy Teels, national biologist with the Ecological Sciences Division, stressed that the Service could carry out the process without ASCS up to the point of setting an easement value. The goal was to publish rules by September 17.

They also discussed potential local obstacles to the emergency wetlands program. Some heads of drainage or levee districts might oppose the wetlands easements, since replacing farmland protected by levees with unprotected wetlands could eviscerate or severely weaken their organizations. Also, bitter disputes were expected in areas where only some landowners behind a levee wanted to move into the wetlands program. Would the other landowners then not have the protection of a repaired levee?

At a September 8 meeting, Lloyd Wright suggested that if ASCS would not cooperate, then SCS would have to act alone. He offered several justifications for this course of action. First, the relief bill recently signed into law gave the Secretary of Agriculture the authority to decide which agency would administer the program. Second, environmental groups and the White House were clearly backing the wetlands alternative. Wright also said that wetlands determinations should be done before making levee repairs and that there should be documentation that the wetlands option was offered to those seeking assistance. One further justification was that, as some SCS staffers stated, the Service could eventually get the entire WRP activity under the Secretary's plan for the creation of a Natural Resources Conservation Service. Billy Teels emphasized that the Service should keep in touch with FWS and EPA in order to build support for an accelerated program. Based on his continuing talks with ASCS, Don Butz felt confident that the two agencies could agree on a joint program. Nevertheless, that afternoon SCS decided to prepare to move ahead with its own wetlands program without ASCS.

A conference call on September 9 with state conservationists from the nine flood-affected states, Lloyd Wright, Billy Teels, Gary A. Margheim (deputy chief for programs), and Larry Babich became a forum to discuss SCS plans to manage the EWRP. Most important was the issue of easement values. Most agreed to define fair market value as the post-flood value plus the value of the reclamation. They also planned to end the one-year ownership requirement that had been part of the WRP pilot program. Based on these discussions with the states, EWRP training was tentatively scheduled for late September in Kansas City.

The Service wrestled with a variety of policy issues when modifying the WRP to fit the needs of the post-flood Midwest. In early September, Lloyd Wright chaired an interagency meeting with FWS, the Extension Service, and EPA in the Chief's office. Two of the most important agencies in the wetlands effort, ASCS and the Corps, did not attend. Wright began by explaining the latest draft wetlands program proposal. All of the flood states but North Dakota, whose state law did not allow perpetual easements, would be in the program. The general counsel for the Department of Agriculture cautioned that, based upon the statutory requirements of the law authorizing the EWP program, they must rebuild eligible levees if asked. The Service, however, could prioritize repairs to push some toward the wetlands option. For example, if landowners who control over fifty percent of the land in a levee district opted for wetlands over repairs, then the levee would be a low priority. All participants stressed the need to avoid any rigid cutoff dates for applications or repairs. Another problem then arose: how could SCS create a priority list of repairs and wetlands when applications would be coming in over a long period, even within each state?

The states reported great enthusiasm for the wetlands option. In mid-September, the Iowa state office stated that it was working closely with a three thousand-acre levee district whose members were interested in participating in the EWRP.¹⁹⁵ As the program was finally approaching implementation in late November, both Tom Wehri, assistant director for Watershed Projects, and Mike Wells, assistant state conservationist in Missouri, admitted that demand for the program would exceed available funds.¹⁹⁶ Personnel at SCS state offices in Iowa and Missouri felt confident they could enroll fifteen to twenty thousand acres if a reasonable price were offered. SCS soils experts estimated that the reclamation of cropland covered with sand could be hundreds of dollars per acre. Therefore, the number of landowners who might opt for the wetlands easement option was expected to be great. The *Des Moines Register* reported that farmers were eager to participate in a streamlined wetlands program.¹⁹⁷

The enthusiasm of farmers was matched by steadily growing public and media pressure for a wetlands reserve policy in the late summer and autumn of 1993. On September 5 an opinion piece in the *Des Moines Register* advocated an expanded WRP sign-up. The newspaper cited environmental groups like the Environmental Working Group and the

¹⁹⁵ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #39, September 13, 1993. See the Iowa section for more detail on what became known as the "Levee District 8 buy-out."

¹⁹⁶ Robert L. Koenig, "Wetlands Invitation Might Get Too Many Takers," *St. Louis Post-Dispatch*, November 23, 1993.

¹⁹⁷ Dirck Steimel, "Wetlands Proposal Catches Iowa's Eye," *Des Moines Register*, September 2, 1993.

National Audubon Society. Iowa, the article continued, had lost all but twenty-nine hundred acres (using a figure from the National Resources Inventory prepared by SCS) of its former 6.4 million acres of wetlands.¹⁹⁸ Environmental groups also pointed out that the wetlands program was a way to limit future flood damages.¹⁹⁹

Staff in the Watershed Projects Division met daily to discuss the EWRP. The main sticking point was the unwillingness of ASCS to pay more for any easement than the post-flood value plus a small "add-on." Such a low easement value would all but guarantee that landowners would demand EWP assistance to rebuild structures such as levees. It was feared that no one would sign up under ASCS rules and that the political repercussions of a failed sign-up would harm the Service's standing with the public, the Secretary of Agriculture, Congress, and the White House. Some in SCS advocated using the post-flood value of the land plus the value of the reclamation as the easement value. Since the land was damaged or had sand on it, it would take years before it could be restored to its previous state. Therefore, this value would approach, but could not exceed, the pre-flood value of the land. Another proposal was to let the state conservationists set the values in each county or part of a state at seventy-five percent of the appraised value. SCS's Economics and Social Sciences Division assisted by providing advice on possible formulas to determine fair market value, such as income capitalization, as well as creating flow charts of the EWRP and levee assessment processes. Because of the damaged nature of the land and concerns in Congress that farmers were given too much per acre under ASCS's nine-state pilot program, SCS was well aware of the need to keep the price near \$700 per acre. All agreed that the Service should pay seventy-five percent of the wetlands restoration costs.

On September 16, SCS moved ahead with a decision memorandum for assistant secretaries of agriculture Eugene Moos and James R. Lyons. The goal was to determine whether the EWRP would be completely under SCS, or would be managed by ASCS with SCS support, as had been the case in the pilot WRP effort. The Service plans appeared compatible with larger political currents. On September 15 Reuters news service reported that the Clinton administration, through Assistant Secretary Lyons, had informed the Senate Environment and Public Works Committee that the WRP should be expanded. He reiterated that SCS would take the lead role on agricultural lands.²⁰⁰

¹⁹⁸ Mark Marturello, "A Set-up for Disaster?" *Des Moines Register*, September 5, 1993.

¹⁹⁹ Curt Anderson, "Program Sets Aside \$15 Million to Return Flooded Land to Rivers," AP Wire, December 1, 1993.

²⁰⁰ "Administration Seeks Larger US Wetland Reserve," Reuters newswire, September 15, 1993.

It became increasingly clear that SCS would handle the program. On September 27, Karl Otte chaired a meeting in the Chief's office with a four-person team brought in from outside national headquarters to speed the rule-writing process. The four had experience with the original pilot WRP program in New York (Donald Pettit), Missouri (Allen Greene), Iowa, (Lyle Asell), and the Midwest NTC in Nebraska (Ivan Wilkinson). At that time, the goal was to publish interim rules in the *Federal Register* by October 15. The Watershed Projects Division decided to make a minimum of \$15 million of the \$60 million August appropriation available for this effort. Offers from landowners for as much as \$45 million worth of easements were expected. The group weighed a variety of approaches. For example, Allen Greene unsuccessfully suggested that the program be changed to a "floodway reserve program" and include land covered by sand in the program, even if this land did not meet the criteria for wetlands. As he had at earlier meetings, Billy Teels stressed that the Corps, EPA, Extension Service, and FmHA needed to be "on board" so they would not delay the program.

Whether due to orders from higher levels of the department, an urge to promote interagency cooperation, or expectations that SCS would fail in the emergency program, ASCS representatives became increasingly cooperative with the Service's efforts in September. They promised that their agency would help in any way it could and acknowledged that they were busy streamlining their own WRP rules. ASCS also suggested that each state's financial and legal community should be involved in the EWRP program in order to assist with easement values and purchases.²⁰¹

On September 29 the four-person committee drafting the emergency wetlands program rules, ASCS, and FWS attended a meeting in the Chief's office. A draft circular for EWRP was discussed. It was decided to give a great deal of responsibility to the state conservationists. In consultation with the Director of the Watershed Projects Division, FWS, and individuals involved with commercial agriculture, state government, and environmental protection, state conservationists would create a committee to suggest easement values and, if it chose to do so, divide the state into regions with different easement values. Some were concerned that farmers, given the chance to provide their views, would lobby to increase the amount the Service offered for easements. Given the non-binding nature of decisions reached by each state's committee, SCS personnel felt confident that this would not be a serious problem. ASCS legal experts continued to insist that a separate appraisal was required for every easement. They claimed that the best method was to use the appraised value plus a small "add-on." This amount would be far below what SCS felt was fair to offer beleaguered landowners for permanent

²⁰¹ It is important to bear in mind that competition or conflict between these two agencies generally existed at the national headquarters level only. Most state and field offices had good relations with ASCS.

easements. The Service decided to utilize committees formed by each state conservationist. A representative from the American Farmland Trust suggested an escape clause to allow farmers to buy out of the easement (with interest) after thirty years. This proposal was rejected immediately.

By October 1, the team completed polishing the rules and Karl Otte began getting departmental clearances for publication in the *Federal Register*. The draft circular was distributed for comment at the annual meeting of all state conservationists in Ohio in early October. Staff also prepared a detailed handbook for the program, complete with sample forms and easement certifications. An EWRP training session, originally scheduled for September, was held on October 12-14 in Kansas City. The training was attended by SCS staff from national headquarters, the Midwest NTC, and the flood states, as well as Corps of Engineers, EPA, and the FWS personnel. Instruction focused on technical problems (wetlands mapping conventions, hydrology tools), financial issues (procedures to establish land values), and administrative procedures (program flow).

The process of gaining approval at the departmental level was slow, and it was not until November 16 that a final rule was published in the *Federal Register*. The rule delegated management of the EWRP from the Secretary of Agriculture to the Assistant Secretary for Natural Resources and Environment. Assistant Secretary James Lyons in turn made the program an SCS responsibility. The rules also stated that the original WRP program was unchanged.²⁰² Rules for the emergency wetlands program itself were published on November 29.²⁰³ In its final form, the program was outlined as follows:

SCS will purchase wetlands conservation easements from persons owning cropland that was damaged by the Midwest floods of 1993. The EWRP will be available to landowners when the cost of cropland reclamation and/or levee repair exceeds the fair market value of the affected cropland. To ensure maximum benefits, SCS state conservationists, in consultation with others, will use a ranking process to evaluate EWRP applications. Ranking criteria included protection and enhancement of habitat for migratory birds and wildlife, floodway expansion, proximity to other protected wetlands, level of wetlands hydrologic conditions restored, wetlands functions and values, likelihood of successful restoration of wetlands values, cost of restoration and easement purchases, and other factors deemed appropriate by SCS.²⁰⁴

²⁰² Department of Agriculture, Office of the Secretary, *Federal Register*, 58, 220 (November 17, 1993), 60541-60542.

²⁰³ *Federal Register*, 58, 227 (November 29, 1993), 62495-62500.

²⁰⁴ "Soil Conservation Service, Emergency Watershed Protection Program, Midwest Flood Recovery Work," December 6, 1993. This short report was prepared by Karl Otte of the Watershed Projects Division.

After the first EWRP sign-up was completed in late 1993, the regular WRP program, under ASCS, held its second sign-up in early 1994. A total of \$66.7 million was available for twenty states to enroll up to seventy-five thousand acres in the program. Unlike the EWRP program, this sign-up covered any wetlands, not just those inundated by the floods of 1993. The response was tremendous. By early April, landowners had offered almost six hundred thousand acres into the program. Of the twenty states, most important were Mississippi with offers for about ninety-one thousand acres, Louisiana for eighty-one thousand acres, Arkansas for seventy-one thousand acres, and Iowa with fifty-seven thousand acres.²⁰⁵ In managing this sign-up, ASCS modified its procedures. To help farmers have a better understanding of the acceptable value for their land, the ASCS county committees provided the expected easement values, which were to be confirmed by regular appraisals. The goal was to reduce the number of landowners who were turned down or who rejected the program at the last minute.

At the March 1994 flood recovery meeting in Kansas City, SCS staff reviewed progress of the first EWRP sign-up, discussed changes to the program based on an audit by the department's Office of the Inspector General (OIG), and distributed part of the \$340 million supplemental appropriation to be used for a second EWRP sign-up in 1994. SCS decided to dedicate a minimum of \$85 million to the emergency wetlands program in 1994. SCS staff in Kansas City also stressed the need for uniformity on expenses such as restoration of wetlands, since cost estimates varied a great deal from state to state. The Midwest NTC was charged with oversight of this process. The 1994 sign-up would run from April 1 to December 31. This eight-month period was designed to enable landowners whose levee repair requests had been rejected the opportunity to enter the wetlands program.

²⁰⁵ "Wetlands Reserve Program Oversubscribed," United Press International, April 8, 1994.

SCS EWRP Acres and Spending²⁰⁶
(All dollar amounts in thousands)

State	1993 Acres	1993 Funds	1994 ²⁰⁷ Funds	Total Allocation
Illinois	1,300	\$ 1,630	\$ 3,300	\$ 4,930
Iowa	5,344	4,790	25,400	30,190
Kansas	1,200	1,220	3,200	4,420
Minnesota	500	650	1,300	1,900
Missouri	9,715	6,800	42,100	48,900
Nebraska	200	220	500	720
South Dakota	4,300	2,230	9,200	11,430
TOTALS	25,400	\$17,540	\$85,000	\$102,540

As a result of the audit by OIG, several minor changes were made to the EWRP program in March of 1994. The Service established clear guidelines for determining separately both the fair market value of the land and the easement value. The fair market value was used to determine program eligibility since the land restoration and levee repair costs must exceed this amount in order to participate in EWRP. It was set by a state technical committee and was based on the post-flood value of the land as if it had been reclaimed. The easement value was derived from and was less than the land value since the landowner would still hold actual title to the land. Also, the land retained value for some activities such as recreation or timber harvesting. OIG stressed the need for clear documentation of how each of these values was determined. All 1994 EWRP money was spent according to the new rules.²⁰⁸

The wetlands programs proved popular with the public and effective at protecting sensitive natural habitat. The Soil Conservation Service played an important role in the WRP, and the lead role in the EWRP effort. Enthusiasm for these programs, however, was not universal. The attention paid to wetlands even as other, long-term activities

²⁰⁶ Note: The dollar amounts include the costs of easements, technical assistance for wetlands determinations and restoration plans, and wetlands restoration cost-share.

²⁰⁷ The acreage is not yet known because the sign-up lasted through December of 1994.

²⁰⁸ In reality, many of the eight states participating in the first EWRP sign-up already had formulas to take the post-flood land value and subtract a set amount or percentage in order to determine the easement value. A February 8, 1994 memorandum from Edward Rickert, Director of the Watershed Projects Division, focused on two other problems found in the OIG audit: first, that reclamation costs be fully justified and be based on pre-flood conditions; second, that Other Eligible Areas (non-crop land included in the easement because it adds to wetlands values which can be up to twenty-five percent of the total easement) must be clearly justified.

(such as the Small Watershed Program) were threatened caused consternation on Capitol Hill. Midwestern members of Congress made clear to Chief Paul Johnson their displeasure that the watershed program was being reduced while wetlands were being expanded.²⁰⁹ Also, many landowners wanted to sell their land and retire or move away, not remain responsible for a perpetual easement and tax liability for the property. Another complicating factor was that the flood destroyed as well as created wetlands, especially in the sand-covered areas of the Missouri River bottom.²¹⁰ The State Biologist for Missouri said that the Service will have to revisit areas covered with sand in five years to see if they had become wetlands. He estimated that as much as twenty-five percent of the formerly farmed wetlands were no longer wetlands.

Finally, there existed resistance to permanent easements or an expanded federal role in wetlands protection.²¹¹ For example, North Dakota's state legislature passed a law which forbade permanent easements. It was directed specifically at the wetlands program. Many of those in the property rights movement or conservative politics rejected what they saw as an expansion of government power.

One important topic discussed within the ranks of SCS was the need for a floodway or floodplain easement program. Many areas flooded in 1993 did not meet the criteria for the EWRP because they were covered with several feet of sand.²¹² SCS staff suggested that an easement program focused more closely on the need to take land in the floodplain closest to major rivers out of commercial agriculture would be more effective in limiting future flood damages and reducing the number of requests for EWP assistance to repair flood control structures.²¹³ In March, Chief Johnson called for environmental easements for areas ineligible for EWRP or WRP. In April of 1994, SCS staff began working on the environmental easement program, which was authorized by the 1990 farm bill, but never funded. The Service announced its plans for this program at the Corps-sponsored meeting on levee repair in St. Louis in late April. As had been the case when writing rules for the emergency wetlands effort in late 1993, developing eligibility criteria and a method of determining easement values proved difficult. Further, no funds were available to implement the program.

²⁰⁹ Kenneth Pins, "House Panel Hears Plea for SCS Plan for Wetlands," *Des Moines Register*, March 16, 1994.

²¹⁰ Jim Patrico, "The Levee Fix," *Top Producer*, (April 1994): 32-36.

²¹¹ For example, see Greg Pierce, "Senators Assail Wetlands Policy," *Washington Times*, July 15, 1994.

²¹² See the section on Missouri for more details.

²¹³ For example, Leroy Holtsclaw for South Dakota supported such a proposal at the March 1994 EWP meeting, but stressed that the program should focus on the floodplains, as did Gary Parker of Illinois and James Wallace of Kansas. In general, the strongest support for an environmental easement program came from those states with the least WRP or EWRP land.

Perhaps the flood and the Service's experience with easements in the Wetlands Reserve Program and Emergency Wetlands Reserve Program, as well as the future environmental easement activity, will help build a "toolbox" from which the government can select the best program to attack local problems in the floodplain, the prairie pothole region, endangered species habitat, or other high-priority areas.

Public Affairs Efforts

The Service's Office of Public Affairs in Washington and public affairs specialists in each of the nine flood state worked with the media and developed a wide variety of materials for distribution to the public. This included public meetings, press releases, videotapes, and slide shows. Two of the best-known publications were *Flood Facts* sheets, one on general questions and answers concerning SCS flood assistance and the other on the EWP program rules. Flood recovery work resulted in more positive publicity for the Service than any other single activity had in the past.

The Service reached out through and was sought out by electronic media. For example, Cable News Network (CNN) interviewed Jeff Vonk, state conservationist in Iowa, about the flood and recovery efforts. In late July assistant chief for the Midwest, John Peterson, represented SCS in a question-and-answer videotape with Secretary Espy and representatives from ASCS, FmHA, and FSIS. He also participated in a radio call-in show from Kansas City. On August 5 FEMA's emergency television broadcast system featured the Service. The program focused on how the Service could assist in the removal of debris from streams and provide other forms of aid. SCS personnel, such as Karl Otte, became "regulars" on FEMA television, discussing topics like levee repair and wetlands.²¹⁴ Excerpts from these programs were also available to the public through cable television's "Weather Channel." In late August an eight-station radio call-in show was broadcast with Missouri state conservationist Russell Mills representing SCS. He discussed levee repairs, debris removal, and CRP regulations.²¹⁵ In Kansas, SCS participated in a one-hour telecast with other USDA agencies and the Kansas Farm Bureau on the Royals baseball network.²¹⁶

FEMA, USDA, and the Corps of Engineers cooperated to produce the *Recovery Times*, a newspaper published five times in August and September. This publication was made possible through the donations of color printing from St. Louis Offset and free distribution by *USA Today*, which placed the publication inside its Midwest edition. SCS also sent extra copies to each of its state offices for distribution to the public. Early editions focused on clean-up efforts, safety tips, and the services offered by various

²¹⁴ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #26, August 5, 1993.

²¹⁵ Disaster Update for August 26, 1993, CES, available from IDEA Information Client through the Internet.

²¹⁶ Disaster Update for August 26, 1993, CES, available from IDEA Information Client through the Internet.

federal agencies. The fourth issue of the *Recovery Times* contained general information on USDA assistance and specific plans for the EWP program. The final edition was published on September 25.

One of the most interesting and well-publicized aspects of SCS's flood recovery efforts was the assistance offered by the Canadian government. On August 31, ten engineers from the Prairie Farm Rehabilitation Administration (a Canadian agency with many of the same duties as SCS) arrived in Kansas City to assist the Service in flood recovery work. They continued to receive their base salaries from the Canadian government but the United States government paid their travel and living expenses. SCS assigned them to Missouri, Illinois, Iowa, and Kansas.²¹⁷ A press conference, managed by Mary Ann McQuinn of SCS's Office of Public Affairs, was held in Kansas City on September 1. Most newspapers in the region published stories about this event, giving SCS a great deal of positive publicity. At least one Kansas City television station did a feature story on Labor Day about the Canadians' work. These detailees played a key role over the next three months in damage assessments and the designs for EWP repair work. On November 29, the Canadians attended a ceremony in their honor in Washington before returning home. The volunteers, their supervisors from the Prairie Farm Rehabilitation Administration (PFRA), a representative from the Canadian embassy, and several members of the press attended. Secretary Espy and Assistant Secretary Jim Lyons personally thanked them for their efforts. The event also received attention in Canada.²¹⁸ For example, the sole female in the Canadian contingent, Stella Fedeniuk, detailed her work in Illinois for the *Winnipeg Free Press*.²¹⁹ Perhaps the most important long-term result of this cooperation was the suggestion by the then Chief-designate, Paul Johnson, that contacts between the SCS and PFRA be expanded and regularized.

Secretary Espy, USDA, and SCS generally received positive evaluations in the press in the early stage of flood recovery efforts. This included small town, regional, and national newspapers, as well as the farm press.²²⁰ For example, in mid-August, a favorable *Washington Post* article discussed the central role played by the Department of Agriculture under the Secretary in the flood response efforts. It chronicled USDA's increasing prominence as attention shifted from disaster relief, led by FEMA, to long-

²¹⁷ SCS Press Release by Mary Ann McQuinn.

²¹⁸ "Memories from the 1993 Flood in the U.S. Midwest," *PRFA Communicator* (March 1994).

²¹⁹ David MacDonald, "Thanks form U.S. for Flood Duty," *Winnipeg Free Press*, November 30, 1993.

²²⁰ See the sections on levee policies, wetlands policies, and each state's EWP effort for more detail on press reactions to SCS's work.

term recovery work. The article also stated that the flood showed that further streamlining of Department of Agriculture services was viable and vital. The concentration of USDA agencies in one office building due to flooding in Des Moines was cited as an example of successful cooperation.²²¹

When SCS and its EWP work were mentioned, the agency usually received high marks from the press. For example, in July a favorable *Wall Street Journal* article stressed the costs of losing topsoil and the success of SCS's efforts such as the promotion of no-till farming.²²² Other Service reports supported this claim. Wisconsin stated that erosion losses on unprotected fields were three to five times greater than erosion losses on fields with conservation practices such as contour strip cropping and conservation tillage.²²³

Despite general success, an August 27 teleconference of all USDA public affairs officials involved with flood recovery did reveal some problems. First, many participants said that they had not heard of *Recovery Times* or FEMA's daily satellite feed program. Second, officials in the Midwest said the main task was not getting information out to the public; rather, it was getting decisions and guidance on major policies such as wetlands and levee repair. Farmers were desperate for specifics on the Wetlands Reserve Program, since this could directly affect their decision whether to plant next year. One other minor problem involved the accuracy of a publication. One of the *Flood Facts* brochures detailed assistance available from SCS. In Missouri, there were complaints about the wording of this brochure, since it seemed to suggest that the Service would provide financial assistance to farmers for flood damage. In reality, SCS would only provide technical assistance for agricultural lands damaged by erosion. At least one farmer wrote to a Missouri Senator and Secretary of Agriculture Espy to complain.

By November, two trends in the media were clear: first, the national media stopped paying much attention to the Midwest, especially as major brush fires occurred in southern California. Second, local coverage brought to light more frustrations with the department and the flood recovery effort in general. For example, in late November, the Secretary of Agriculture was criticized during his visit to Jefferson City, Missouri, by the Missouri Rural Crisis Center of Columbia. Its director claimed that the USDA was not

²²¹ Michael S. Arnold, "Espy to Ride the Crest of Flood Recovery Efforts," *Washington Post*, August 12, 1993.

²²² The article contained several quotations from the Iowa state conservationist, Jeff Vonk. Scott McMurray, "Midwest Deluge Thwarts Efforts to Protect Soil," *Wall Street Journal*, July 20, 1993.

²²³ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #8, July 12, 1993.

doing enough to help farmers.²²⁴ Others raised specific policies, such as Espy's decision to eliminate the acreage reduction in corn in 1994 due to 1993's poor harvest. This decision threatened to increase production and drive prices down.²²⁵

Although the Soil Conservation Service continued to keep the public informed of activities such as the Emergency Wetlands Reserve Program, conservation compliance, and Emergency Watershed Protection work through the local press in the Midwest, the national press largely forgot the floods and their aftermath in 1994.

²²⁴ Dan Fitzpatrick and Beth Pigg, "USDA Secretary, Farmers Clash," *Columbia Missourian*, November 23, 1993.

²²⁵ Marlene Lucas, "Farmers Fuming at Espy," *The Cedar Rapids Gazette*, November 18, 1993.

The Dakotas

Examining the experiences of North and South Dakota highlights the great variation in flood damage and the different approaches taken in recovery work.

Overall, flood damage was less in North Dakota than in many of the other nine states. Staff in the state office stressed that issues of water supply and water quality have attracted more public concern recently. Nevertheless, at SCS meetings, North Dakota staff stated that there was a perception in the state that they received less attention in flood recovery efforts than "glamour areas" to the south. They pointed out that this neglect was seen not only within the ranks of SCS, but also with FEMA, which was accused of paying relatively little attention to North Dakota. One other problem state staff pointed out was that the Presidential disaster declaration came much later for North Dakota than other states. Emergency Watershed Protection work was well underway even before FEMA arrived. Thus, the emergency agency did little to cooperate with SCS or assist with DSR's during the late summer of 1993.

North Dakota's EWP effort was concentrated in the eastern third of the state and the north central region around the Souris River. Given the limited geographic nature and relatively few requests for EWP assistance, all work was coordinated out of the state office; no separate project offices were established. North Dakota held EWP and ECP training during the first week of August, even as more counties were declared disaster areas. The state office also contacted county commission boards, water resource boards, soil conservation districts, the state engineer, and the Governor's office in order to explain the assistance available through EWP and ECP.²²⁶ By early August, two projects for debris removal around bridges had already been completed along the Sheyenne River in the southeastern part of the state. Most of the work focused on clearing streams around bridges. About 210 DSR's were received. Of the ninety eligible projects valued at around \$1.4 million, eighty were for debris removal and ten for erosion control. In the realm of cultural resources, at least six EWP jobs were temporarily delayed while specialists examined the sites.

The experience of North Dakota can be contrasted to the flood recovery work undertaken in South Dakota. By coincidence, the South Dakota Office of Emergency Preparedness held a meeting in January of 1993 in order to discuss with federal agencies procedures for responding to fire, flood, or drought. This coordination was tested

²²⁶ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #27, August 6, 1993.

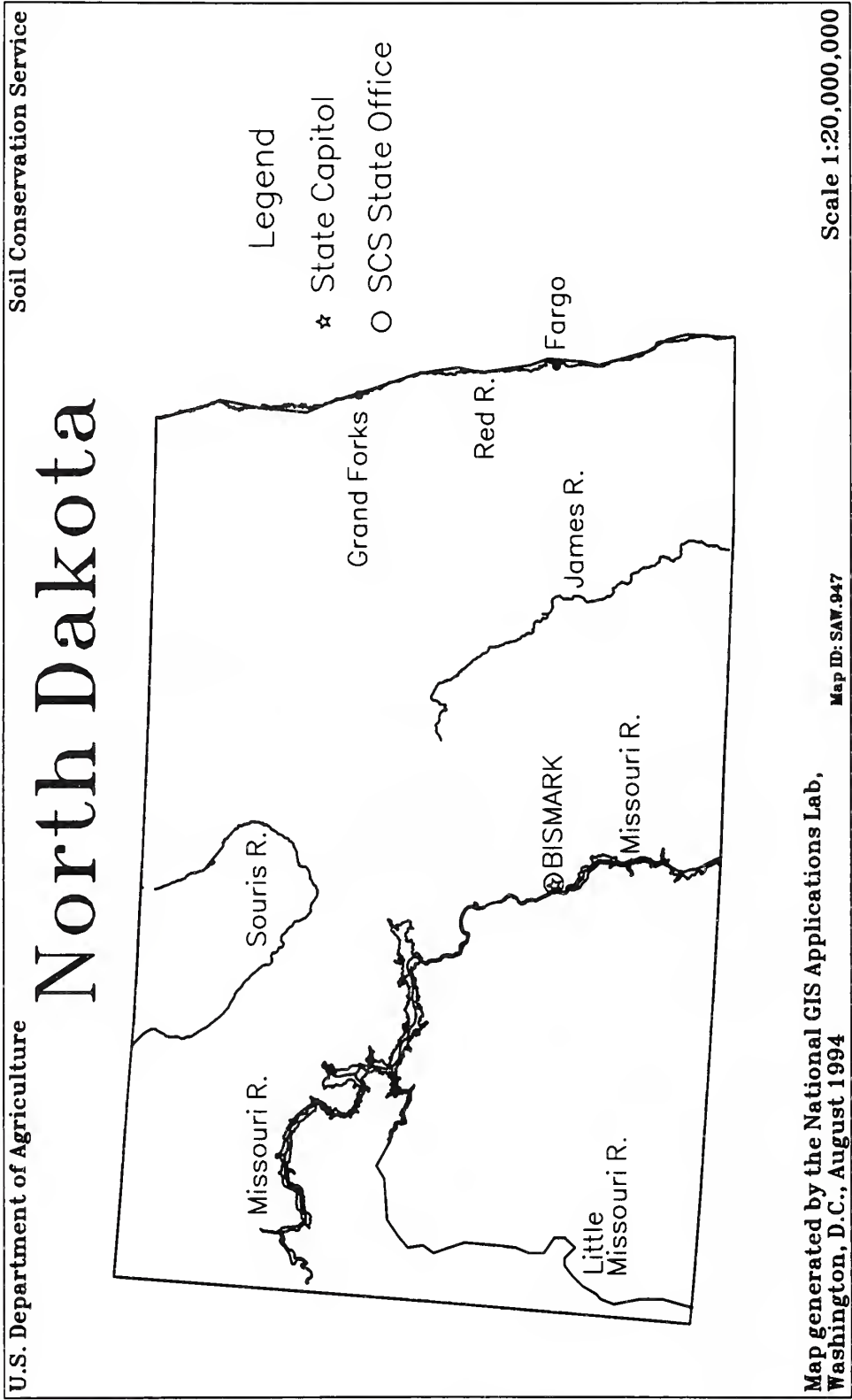
sooner than anyone had expected. In this state, the great flood of 1993 began with excess precipitation in 1992. By April of 1993, excess rain on the saturated ground led Congressman Tim Johnson to call upon SCS to repair damaged agricultural levees. In July, SCS began to assist with damage assessment work. Field offices in forty-one counties in the eastern part of the Mount Rushmore State helped local emergency boards.²²⁷ EWP work began in earnest during July, when funds from an earlier emergency project in Arizona were transferred to South Dakota. This money enabled SCS to contract for its first emergency project at Lake Madison, where overtopping of a dam began to wash out the outlet, thus threatening a nearby trailer park. The job cost about \$10,000 and was completed in only three days. The local sponsor provided fill material and seeding as its portion of the cost-share.

South Dakota was the only state where levee repair was the predominate type of emergency work. A total of eighty-eight requests for assistance were received in South Dakota. Of these, sixty-seven projects, valued around \$1.5 million, were eligible for the EWP program: one for debris removal, three for erosion control, and sixty-four for levee repair. All but two of these jobs were completed by April of 1994. EWP work was confined to five counties in the eastern part of the state. Other than a few towns or conservation districts, most EWP work was sponsored by the Union County commissioners or the Turner Lincoln Clay Water District. One temporary project office was set up in Centerville in the office of the water district. The main barrier to work was standing water. By July of 1994, however, only two EWP jobs were still in progress. Despite heavy rains which had fallen in the northeast part of the state during April, no further work was contemplated.

In South Dakota, relations between SCS and the Corps were cordial, perhaps because the latter was not involved in building or maintaining levees there. The four hundred square mile drainage area delineation between the two agencies work was never an issue, as the Service made the repairs.²²⁸ SCS focused on relatively small agricultural levees, most of which were five to twelve feet high. Many had trees on them, a situation which clearly ran counter to both SCS and Corps maintenance standards. State staff stressed, however, that trees are rare enough in South Dakota that cutting them down, even on levees, was highly unpopular with local residents. These trees form windbreaks which prevent erosion and natural snow fences which limit drifting.

²²⁷ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #14, July 20, 1993.

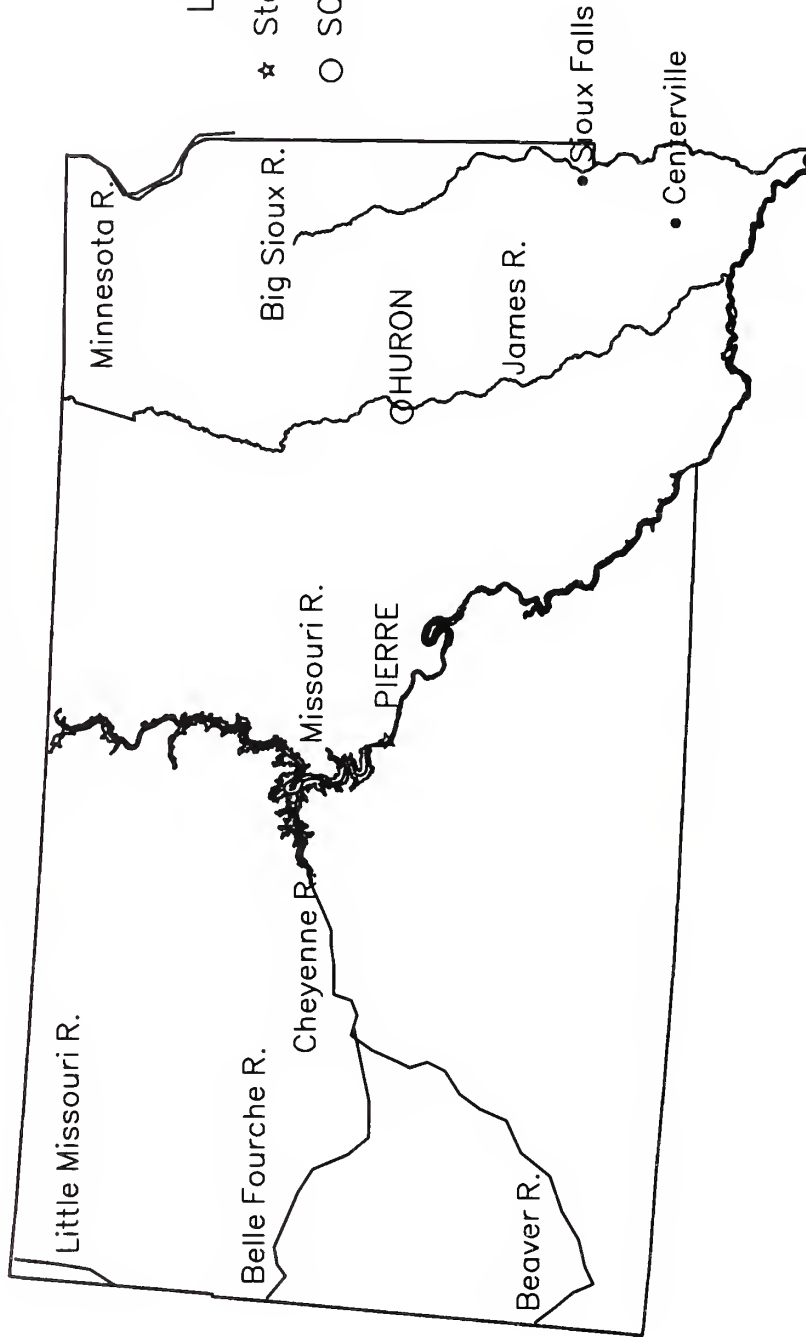
²²⁸ The Corps had already stated that these levees were not eligible for repairs or inclusion in their system.



U.S. Department of Agriculture

Soil Conservation Service

South Dakota



Legend

- ★ State Capitol
- SCS State Office

Map generated by the National GIS Applications Lab,
Washington, D.C., August 1994

Map ID: SAW.942

Scale 1:20,000,000

Although South Dakota was not one of the pilot WRP states, staff did identify two million acres of wetlands. There were thirty-two sign-ups for Emergency Wetlands Reserve Program in December 1993. Even as SCS prepared the letters which would have finalized the easements, ASCS announced their upcoming sign-up for the WRP program. Farmers felt that they could get more money from the latter, and half rejected the Service's offers. Many hoped that ASCS's appraisal process would result in a higher easement value than SCS's strategy of using a state technical committee and crop values to set easements for each crop reporting region. By mid-March, over five hundred landowners had signed-up for the next round of WRP. Staff in the state office felt that public interest in the second EWRP sign-up, which lasted from April through December of 1994, had been reduced due to competition with the WRP. As a result, the Service began to work with the Fish and Wildlife Service and the Farmers Home Administration to find ways to improve the acceptance rate of EWRP easement offers.

On the other hand, North Dakota was ineligible for the EWRP because its state legislature passed a law to block permanent easements by setting a thirty-year limit on them. The Service refused to allow thirty-year easements to replace the permanent easements used in the other states for two reasons. First, some staff felt that Congress would find this unacceptable. Second, others stressed that if North Dakota became an exception, other states would soon follow suit.

One of the major issues in North Dakota's EWP effort was channel clear-out. In recent decades, Dutch elm disease killed many trees along streams and channels. Then, during the five or six years prior to 1993, the state suffered from drought conditions in many areas. As a result, there was a great deal of debris ready to fall or flow into channels after the heavy rains of 1993. Local drainage districts and county governments called upon SCS to help clear these channels. The Service focused its initial EWP efforts on removing debris around bridges. Each rainfall in late 1993 and early 1994 steadily dislodged and moved debris downstream, often re-clogging the same constricted areas around bridges that SCS had just cleared.²²⁹ As a result, personnel in the state office decided that the volume of debris in these channels was beyond what drainage districts could cope with in their regular operations and maintenance (O & M) efforts.²³⁰

At the March 1993 EWP meeting in Kansas City and afterward, North Dakota staff announced that they wanted to help with this channel clear-out in order to help local government back into its regular O & M schedule. As state conservation engineer Wes Wiedenmeyer explained, environmental groups supported SCS's role in this task, since

²²⁹ For example, in mid-May 1994 parts of North Dakota received five to seven inches of rain, thus re-clogging some channels.

²³⁰ Most counties have regular O & M plans to clear a set number of miles each year.

the Service was bound by a variety of federal laws concerning wetlands and cultural resources, while counties may lack information or interest in these requirements. Experts at the North Dakota state offices estimated that its channel work could have cost up to \$4 million. Some stretches of channel were as long as thirty-five miles. They urged the national-level SCS support this endeavor since landowners and SCS employees in North Dakota were already disappointed that they were unable to join in the emergency wetlands easements effort. Further, they pointed out that each of the flood states was able to devote its share of EWP funds toward the problem most pressing in their states--i.e., levee repair, streambank stabilization, or wetlands easements. Should not North Dakota staff be able to focus on the problem which that state's citizens found most severe? In the end, the Watershed Projects Division at national headquarters provided an additional one million dollars to assist in the most critical cases.²³¹ During the summer of 1994, SCS in North Dakota worked with water resource district boards to reach agreements for completing this work.

As was the case in North Dakota, some citizens in South Dakota wanted SCS to perform extensive channel clear-out work. Since state staff determined that this was routine maintenance and that most channel blockages were not the result of the 1993 floods, SCS refused to do the work. Also, the U. S. Fish and Wildlife Service was not in favor of it.

In early August of 1993, North Dakota reported major successes in flood control due to SCS's Small Watershed Program. For example, the English Coulee Dam and diversion project held back 350 acres of water up to twenty feet deep, thus protecting part of the University of North Dakota and the city of Grand Forks.²³² The dam and floodway had been constructed in response to a devastating flood in 1979. The project was completed in July 1992 at a cost of \$7.5 million. Local communities and infrastructure were protected even after as much as ten inches of rain fell in the Grand Forks area in late July.²³³

Although many farmers had suffered crop losses due to excess moisture over three straight years (1991-1993), this type of damage was not eligible for assistance under the EWP program. SCS experts, however, did meet frequently with county disaster boards and landowners to offer technical advice on restoring cropland. In eastern North Dakota, fungus diseases that were flourishing in the cool and wet conditions represented

²³¹ "Critical" meant areas upstream and downstream from bridges and residential areas. In many ways, this was simply the expansion of the scope of earlier EWP debris removal work.

²³² Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #23, August 2, 1993.

²³³ Hope Aadland, "The English Coulee Diversion Project: A Flood Success Story," *North Dakota Water* (October 1993).

a significant threat to agriculture. The state Department of Agriculture estimated that losses were up to twenty-five percent in some small grain fields.²³⁴ Leroy Holtsclaw, assistant state conservationist in South Dakota, pointed out that the topography of much of the region could be likened to a coffee filter. There were few rivers or streams into which excess water could flow; it could only drain slowly away into the ground.

²³⁴ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #29, August 10, 1993.

Illinois

A representative of the Office of the Governor summed up flood damages in Illinois to the United State Congress:

The great flood of 1993 represents the worse disaster in Illinois in the century-- sixteen thousand citizens were forced out of their homes; 872,000 acres of farmland were inundated; entire communities were flooded; hundreds of small businesses were damaged or destroyed; and overall, millions of dollars of personal property were lost.²³⁵

In the context of the problems listed above, the Service's work must be seen as an attempt to restore both the economic and environmental health of the state.

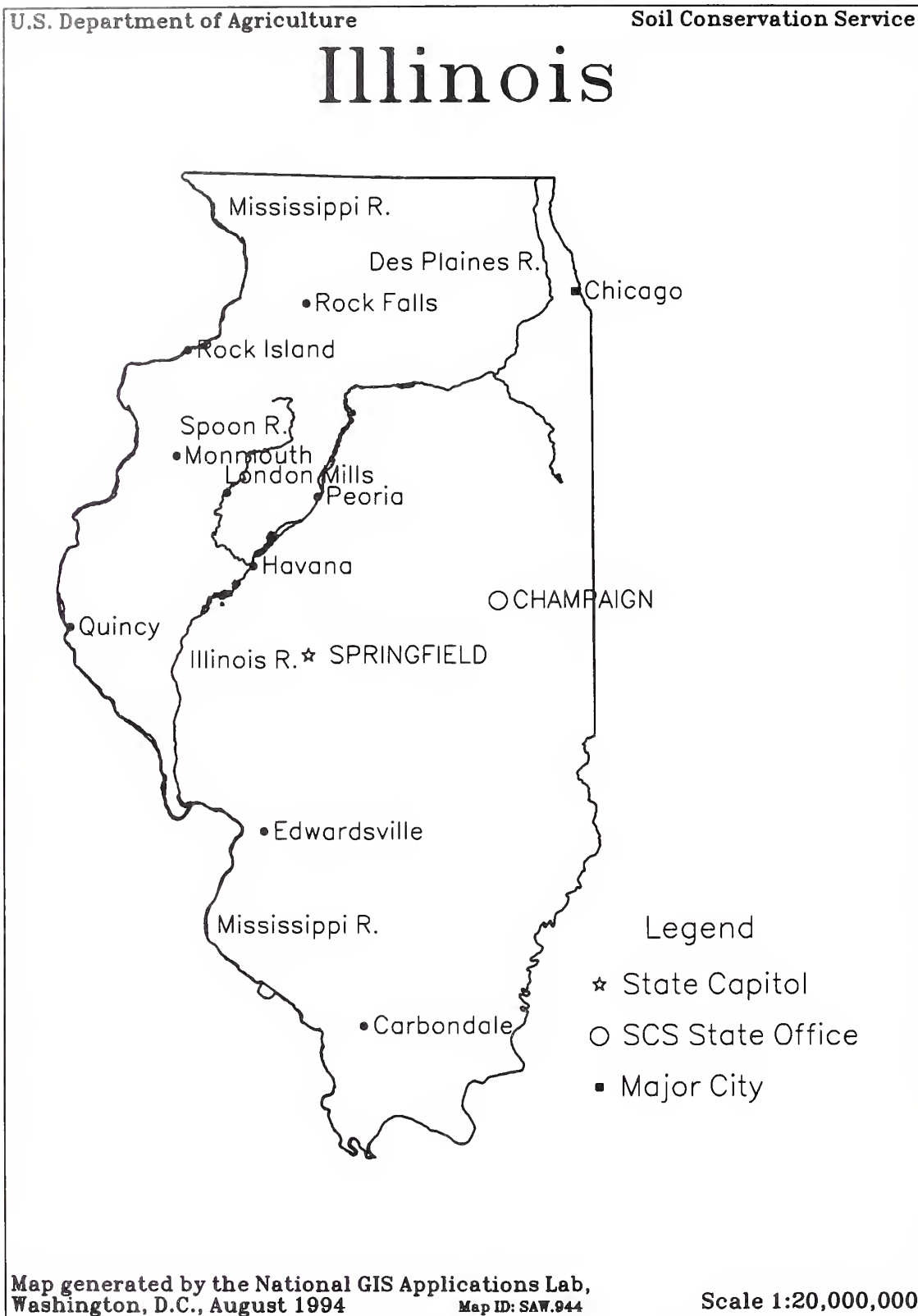
The 1993 floods hit the western half of Illinois, that is, the area from Peoria westward to the Mississippi River. Flooding in upland areas was the result of heavy rainfall; lowland flooding was primarily caused by the rise in the Mississippi River due to rainfall in Minnesota, Wisconsin, and the Dakotas. By mid-July, SCS reported that half a million acres were under water in Illinois. A major problem in Illinois, as in all states, was that the Service was unable to assess damages immediately due to high water.²³⁶ For example, the Illinois River first rose due to heavy rains in the uplands, then went down, then went back up yet again due to rising water on the Mississippi. State staff reported that this river backed up due to Mississippi River flooding and overtopped levees.

Even before SCS employees began EWP work, many became involved in the flood as victims of the rising water or volunteers in relief efforts. The August/September issue of *Current Developments*, published by the Service in Illinois, detailed some of the efforts of individual SCS-ers in responding to the flood. At least one district conservationist, Ron Hall, served in the National Guard and assisted in shoring up levees. Another, Joe Gates from the Moline office, took the initiative to fly his own airplane to help survey flooded areas. Rob Meats not only worked on the Sny Levee, but also helped supply food and water to others struggling to save that structure. Some SCS employees in areas outside the floodplains helped gather donations of food and clothing.²³⁷

²³⁵ Statement of Allen Grosboll, Executive Assistant, Office of the Governor, Springfield, Illinois, in *Federal Response to the Midwest Floods of 1993*, 22.

²³⁶ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #9, July 13, 1993.

²³⁷ Paige Mitchell, "Conservationists Fight the Flood of 1993," *Current Developments*, (August/September 1993): 2-5.





SCS Soil Scientist Karla Hanson wades through the muck while gathering soil and sediment samples at a flooded site. Photo from SCS-Illinois.

Overall, assistant state conservationist Gary Park managed the EWP program in Illinois. One difference from many of the other states was that the area around the state office in Champaign suffered no flood damage. Much of the staff moved out of the Champaign headquarters to five emergency response centers--in Rock Falls, Monmouth, Quincy, Edwardsville, and Carbondale.²³⁸ The centers were set up as flood damages spread downstream--the Rock Falls office was established in August while Carbondale, in the south, was set up in November. Engineers, some detailed from the state office, headed all five of the response centers.

By early July of 1994, SCS had completed 558 Damage Survey Reports (DSR's). Of these, 372 were eligible for assistance and 357 had already been completed. Of the eligible projects, 143 were for debris removal, 195 for erosion repair, and thirty-four for levee repair. Scouring around bridges was the single most prevalent problem. County highway departments were frequently sponsors of EWP projects. It is important to bear

²³⁸ As explained by Gary Parker and others, state conservationist Charles Whitmore wanted most repair decisions concerning the EWP program to be made in the field by those most familiar with local conditions, not in the state office hundreds of miles away.

in mind, however, that these are statewide figures. The type of EWP work could vary a great deal within the state--for example, some counties along the Mississippi or between the Mississippi and Illinois rivers had no problems other than levee breaks.

Those hardest hit by the floods lived along the Mississippi River where water stayed high and delayed the Corps' mainline levee repairs. Most of the Service's flood recovery efforts, however, was completed by early 1994. Unlike some of the other flood states, the state staff in Champaign stated that they did not expect that their 1994 workload would be beyond their capabilities. They also did not plan to grant many variances to the conservation compliance provisions of the 1985 and 1990 farm bill. Assistant state conservationist Harry Slawter pointed out several reasons for this. First, while Iowa had excessive moisture in 1992 and 1993, Illinois faced this problem only in 1993. Illinois did not have the upland damage of Iowa or the sand deposits in the floodplain that Missouri did. Most farmers who were impacted by the flood or rainfall in Illinois were only two or three weeks late in bringing in their crops in 1993. Second, the cropland most devastated by the flood was flat bottom land along the major rivers. This was not highly-erodible land (HEL). Therefore, it had not required extensive measures to limit erosion in the first place.

The Service had little involvement with Illinois' levees prior to the flood. As was the case in most states with levees, more time was spent discussing their repair than many staff felt was necessary. All but two of the levees along the Mississippi River were repaired by the Corps. SCS was briefly involved with one of the remaining levees. In this case, the Corps staff in St. Louis had agreed with SCS's plan to repair the Len Small Levee along the Mississippi. The Corps leadership in Washington, however, strongly objected to this plan. The Service then turned the project over to the state, which made the repairs with FEMA funds and the SCS's original design. The remaining mainline levee was repaired by a county government. Reflecting the relative lack of conflict or major problems in levee repair in Illinois, no SCS personnel were assigned to the state DFO in Moline; rather arrangements were carried out by telephone. When the \$50 million in supplemental funds were made available for levee repair in early 1994, only one request was expected for this assistance.

Besides the more common tasks of stabilizing streambanks, removing debris from streams, and repairing levees, the Service was involved in three unusual projects that illustrate the range of work and cooperators involved in EWP efforts. In Scott County, a stream was blocked by debris under a railroad bridge. The Norfolk and Southern Railroad Company was eager to work with SCS to protect this vital transportation link. The railroad hauled the rock needed to shore up the banks around the bridge without charge, thus speeding repairs. In a widely-publicized project, one of the volunteers from

Canada played a key role in protecting the town of Havana, Illinois. Citizens did not face the threat of erosion caused by rainfall or flooding caused by a rising river, but rather from water percolating up through sandy soil outside of Havana, which had become saturated by the constant rain. The water threatened to flood the town. Stella Fedeniuk, an engineer from Canada's Prairie Farm Rehabilitation Administration, along with SCS staff and a local engineering firm, developed a plan to pump water about one mile from the sandy area to the Illinois River. One of the main barriers was finding enough pipe on short notice to move the water. After this was done, SCS permanently loaned the city the pumps and followed up with a more comprehensive watershed planning effort.²³⁹

Finally, EWP work was directed toward protecting important sources of income for communities. Many of those who enjoy Edgar Lee Masters' classic of American literature, *Spoon River Anthology*, have made a pilgrimage to the town of London Mills along that river.²⁴⁰ Tourist income from the site was threatened by streambank erosion. SCS moved quickly to use rock fill and rip-rap along about three hundred feet of the river to protect the town's infrastructure and economic well-being.

The experience of Illinois provided one example of how SCS dealt with cultural resource and environmental issues in its EWP work. Technically, neither the environmental nor the cultural resource impact statements were required for each EWP job, since a program-wide Environmental Impact Statement (EIS) had already been completed by SCS. Several states, however, developed supplementary checklists in order to focus staff attention on these increasingly important issues.²⁴¹ The one-page impact assessment used in Illinois looked at the short- and long-term effects upon a site with and without the EWP treatment or repair measure. The specific environmental factors included wetlands, wild/scenic rivers, endangered species, floodplains, cultural resources, natural areas, channel modification, prime/important farmland, riparian areas, visual resources, special aquatic sites, erosion, and water quality. The state office made available to field staff a short primer of the requirements and major laws concerning each of these environmental concerns.

²³⁹ For more details about a variety of specific EWP projects in Illinois, see *Current Developments*, a bi-monthly publication produced by the Public Affairs staff in the Champaign state office.

²⁴⁰ Masters grew up in Lewisburg, a town along the Spoon River in central Illinois. His monologues, written in free verse, were based upon life in this and other small towns. The names given to characters in the book were taken from graveyards in the area.

²⁴¹ During the summer of 1994, some SCS staff and others in the cultural resources field advocated requiring a finding of no significant impact upon cultural resources for each separate EWP job. Those involved in performing the emergency work generally objected to this requirement. First, there were no major problems with EWP work during this, the largest disaster response in SCS history. Second, timeliness is one of the key factors in the emergency program. Could these new requirements slow the Service's response?

Illinois had no full-time cultural resource specialist or archaeologist on staff; rather these duties were handled by William Lewis, Jr., an agricultural economist. The environmental impact statement which accompanied every DSR, however, included a short section on cultural resources. These were reviewed by an archaeologist from the U. S. Forest Service in southern Illinois, Mary R. McCorvie.²⁴² In light of the emergency nature of the repair work, decisions had to be made quickly. Review of sites was prioritized based upon the expected start dates for EWP work. The archaeologist then visited the twenty-seven sites that seemed most likely to have an impact upon cultural resources. The report prepared by the archaeologist stated that no sites were harmed by the Service's EWP work. Eventually, the state historical preservation officer (SHPO) sent letters to the SCS state office in Champaign, confirming that no cultural resources were disturbed by the emergency repair work.

One particular site where SCS helped protect an important historical resource was at Fort De Chartres, a park managed by the Illinois Historical Preservation Agency. The fort is listed in the National Register of Historic Places because it served as a center of French influence in the region from the 1720's until surrendered to the English in 1765. Floodwaters cut a large gully eight feet deep and over one thousand feet long through the park. As the Corps rebuilt a nearby levee, SCS contracted to repair erosion damage around the walls and buildings at this site. The Service took special care to assure that borrow, fill material used in the repair, taken from a nearby site did not disturb any local cultural resources.

Perhaps more than any other state, the SCS staff in Illinois directly connected data they gathered on DSR's in the field to summary reports in the state office and information made available to the public and Congress. The Public Affairs staff used this unified database to create "Illinois Floodlines," which included charts of every possible EWP site, including location, impairment, cost, start date, and other information broken down by congressional district. Further, SCS made clear on these sheets which projects were ineligible for EWP assistance. Providing information on the status of all requests for assistance helped cut down on the number of queries from the public and assured them that the Service was acting upon their requests. It was particularly useful information for congressmen and their staffs, since many citizens turn to them when they want disaster assistance.

²⁴² SCS paid for travel expenses while the Forest Service continued to pay her regular salary.

SCS employees brought together a wide variety of organizations and technology. For example, at the request of a congressman, SCS's Resources Inventory and Geographic Information System Division (RIGIS) created a series of hydric soils maps of Illinois.²⁴³ These maps utilized an AVHRR satellite image from June and July of 1993. The images were compared in order to indicate the areas of flooding. This was then combined with the USDA-SCS State Soil Geographic database. As a result, a map was produced which indicated soils which were sixty percent or less hydric, sixty-one percent to eighty percent hydric, or greater than eighty-one percent hydric. Finally, the Service developed a list of total acres flooded and acres of hydric soils flooded for each county in the state. Such materials helped locate concentrations of wetlands.

Although the wetlands program proved popular in neighboring Iowa and Missouri, in Illinois there was little interest among landowners. Perhaps the most important reason for this was the higher land values, especially in the fertile Mississippi River floodplain, which made the \$800 per acre offer for a permanent easement too low.²⁴⁴ Harry Slawter provided some other reasons that only about one thousand acres were offered in the first EWRP sign-up. First, some farmers wanted to sell title to all their land, not just the easement, then retire and move away from the area. Second, Illinois had less cropland inundated than Iowa or Missouri (the two states with the greatest interest in WRP and EWRP). Third, the area inundated, the Mississippi floodplain, was behind levees which the Corps was repairing. Fourth, Illinois was not in the original WRP pilot program. As was the case with the pilot program in other states, in their first experience with wetlands easements, landowners were at times unrealistic in their expectations of what lands would be eligible and how much they could get for that land.

As was the case with the lack of interest in EWRP, the success or failure of SCS policies was often at the mercy of outside forces. For example, the Service was at times drawn into local disputes over which it had little control. One controversial incident occurred near Peoria, Illinois. SCS became caught up in a labor dispute as unions picketed an out-of-state non-union contractor performing two EWP jobs.²⁴⁵ There was vandalism and at least one fight. Union members alleged that the contractor was paying illegal wages, that is, not paying the rates mandated by the Bacon-Davis Act. In the end, there was no evidence of impropriety. The incident was forgotten quickly as the firm is no

²⁴³ Hydric soils are defined as soils "which are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions on the upper part." The soils are one key criteria for wetlands determinations. The other two are the presence of standing water and certain plants.

²⁴⁴ This value was set by a committee made up of SCS, FWS, Extension Service, ASCS, FmHA, the Rural Appraisers, Farm Bureau, and the state Department of Agriculture.

²⁴⁵ Actually, only about ten percent of the contracts went to out-of-state firms. These contracts, however, were usually larger than average.

longer in the area. Given the fact that the picketed contractor had submitted the lowest bid, there was relatively little SCS could do to reject it without evidence of incompetence or wrong-doing.

Area conservationists (AC) played an important role in the EWP program. One good example of their work can be seen in the efforts of Richard Macho, an AC in Edwardsville, Illinois. He defined his role first as "logistics," that is, helping the head of the local emergency response office set up and begin flood recovery work. His goal was to free the hands of the EWP manager while remaining focused on his regular work, especially FSA, as much as possible. His tasks included coordinating detailees and obtaining vehicles and equipment, and serving as a liaison between sponsors, Congress, and SCS when questions or disputes arose over work. For example, some drainage districts wanted SCS to contract for work which was not eligible for EWP assistance, such as raising levees or cleaning out ditches that had been clogged even before the floods.²⁴⁶ Macho reviewed EWP rules with unhappy drainage district managers and contacted congressmen to explain eligibility requirements. Despite these disputes, he felt that the Service was very popular and that the public was very confident in the organization's ability to assist after a disaster. He contrasted this with criticism of FEMA for not understanding the needs and culture of agriculture or small, rural communities.

Macho also pointed out a dilemma often mentioned by SCS employees in the flood areas: they valued the help and new perspectives that detailees from other states could bring. At the same time, they felt that the ability of these detailees was uneven and that many had been sent as much for EWP training as to actually help in this disaster. Also, some detailees stayed only two weeks. It was inefficient and disruptive to have such a high turnover of personnel during such a frantic time.

Staff in Illinois made clear that SCS's flood response work greatly raised the agency's profile. The Service was now thought of as more than an "erosion agency." Further, the ability to see a problem, react quickly, and produce concrete results within a few weeks was a great boost to the morale of SCS personnel in the field.²⁴⁷ Many emphasized that the field office structure was key to what they saw as a very successful EWP effort

²⁴⁶ EWP allows repairs only to restore pre-flood conditions. Also, SCS may only assist with damage actually caused by a disaster. Maintenance of draining ditches and channels was often a delicate issue due to disagreements over what damage was caused by the rains or floods of 1993 and what damage was the result of the lack of long-term, routine maintenance by the local drainage district. See the sections on North Dakota and South Dakota for other approaches to this problem.

²⁴⁷ This feeling of accomplishment must also be understood in the context of the Small Watershed Protection program, where a single project may require decades to plan and implement.

because it built close ties with rural America. SCS's experience was contrasted with that of FEMA and the Corps, which were sometimes accused of lacking an understanding of and rapport with small towns and farmers.²⁴⁸

Unfortunately, 1993 was only the beginning of the flood disaster and EWP recovery work in Illinois. While attracting relatively little notice outside the areas directly affected, heavy rains in April of 1994 led to eleven Illinois counties receiving disaster declarations. The counties included some that had been devastated in 1993. Because the ground was already saturated and many structures had been weakened by the event of 1993, damage was heavy. SCS responded by re-opening an emergency office in Edwardsville, which is located directly east of St. Louis. One hundred and eighty-one applications for assistance were received; 125 for erosion control, thirty for debris removal from channels, and twelve for levee repair. The estimated cost of these repairs was \$5.5 million. Even with the assistance of detailees from other states, this work was expected to continue well into 1995. It was only in the shadow of the massive 1993 flood that this level of EWP activity received as little attention as it did.

²⁴⁸ There is a great deal of anecdotal evidence to support this view. However, it is also important to bear in mind that in many quarters of SCS, support of the field office structure has been elevated almost to the level of gospel.

Iowa

Lying between the Mississippi and Missouri rivers, Iowa was the state hardest hit by the floods of 1993. In early July, the Iowa state office reported that 1.1 million acres were flooded in that state: half a million acres had erosion greater than twenty tons per acre, eight hundred thousand acres had erosion between ten and twenty tons per acre, and there were two hundred and fifty thousand acres of standing water in upland areas.²⁴⁹ Flood damage and EWP work were concentrated in two corners of the state, where small and medium sized rivers flow into the Mississippi River (southeast corner) and Missouri River (southwest corner). Because Iowa had only managed one EWP contract in the twenty-five years prior to the 1993 flood, staff had to become familiar with the emergency program's procedures very quickly. Between July of 1993 and January of 1994, they received over twelve hundred requests for assistance, more than any other state.²⁵⁰

The flood directly disrupted SCS operations. On July 8, up to ten inches of rain fell in the Des Moines area. During the weekend July 10 and 11, floodwaters cut-off access to the SCS state office in the state capitol.²⁵¹ That Monday, the Service shifted its operations to the West Des Moines ASCS offices. Many staff members were sent out to the district or area offices. Others, such as the public affairs staff, worked out of employees' homes. The first EWP contracts were prepared by July 16 even as the heavy rains continued. Up to ten inches fell in southwestern Iowa on July 24 and 25. On August 9, four to seven inches of rain fell in central Iowa, reflooding many areas.

Under state conservationist Jeffrey Vonk, the flood response effort in Iowa was led by assistant state conservationist Lyle Asell. On July 19, an Emergency Operations Center was established in Indianola, which is also the location of an area office. After the initial start-up of the program, Marty Adkins, a former Resource Conservation and Development Coordinator, assumed responsibility for day-to-day operations in Indianola. Engineering offices were established in Atlantic (for western Iowa) and Williamsburg (for eastern Iowa). Staff in these offices drew up most of the plans for EWP repairs. The Service provided one hundred percent of repair costs on eligible projects until early December of 1993. Projects approved between this time and the end of the EWP sign-

²⁴⁹ James M. Reel, Iowa WRPS Leader, to Larry Babich, Watershed Projects Division, July 9, 1993.

²⁵⁰ Much of the information in this section comes from three sources: a short booklet produced by the Public Affairs staff in Iowa entitled "The Flood of 1993: Response, Repair, and Recovery," (March 1994); a report by the state office, "Iowa Emergency Watershed Protection (EWP) Program-July 1993 through Present," (March 1994); and interviews.

²⁵¹ Simultaneously, the Des Moines water works, which served two hundred and fifty thousand customers, was shut-down. For more details on the 1993 flood and attempt to protect municipal water supplies, see *Iowa Groundwater Quarterly* 4, 4 (December 1993).

up on January 15, 1994, were done under a 80:20 cost-share arrangement. In March of 1994, the Iowa state office ordered that all future cost-sharing follow the new 75:25 split as mandated in the watershed manual.

By early July of 1994, contracting had been completed for 305 of 763 eligible projects.²⁵² Hundreds of repair requests were referred to agencies better able to respond. Sponsors included not only county governments, cities, and levee districts, but also the Iowa Department of Natural Resources and the Iowa Department of Transportation. The most common problem requiring SCS help was bank stabilization and erosion control work--about seventy percent of the total requests. Next came debris removal from water courses--about twenty percent of the requests.²⁵³

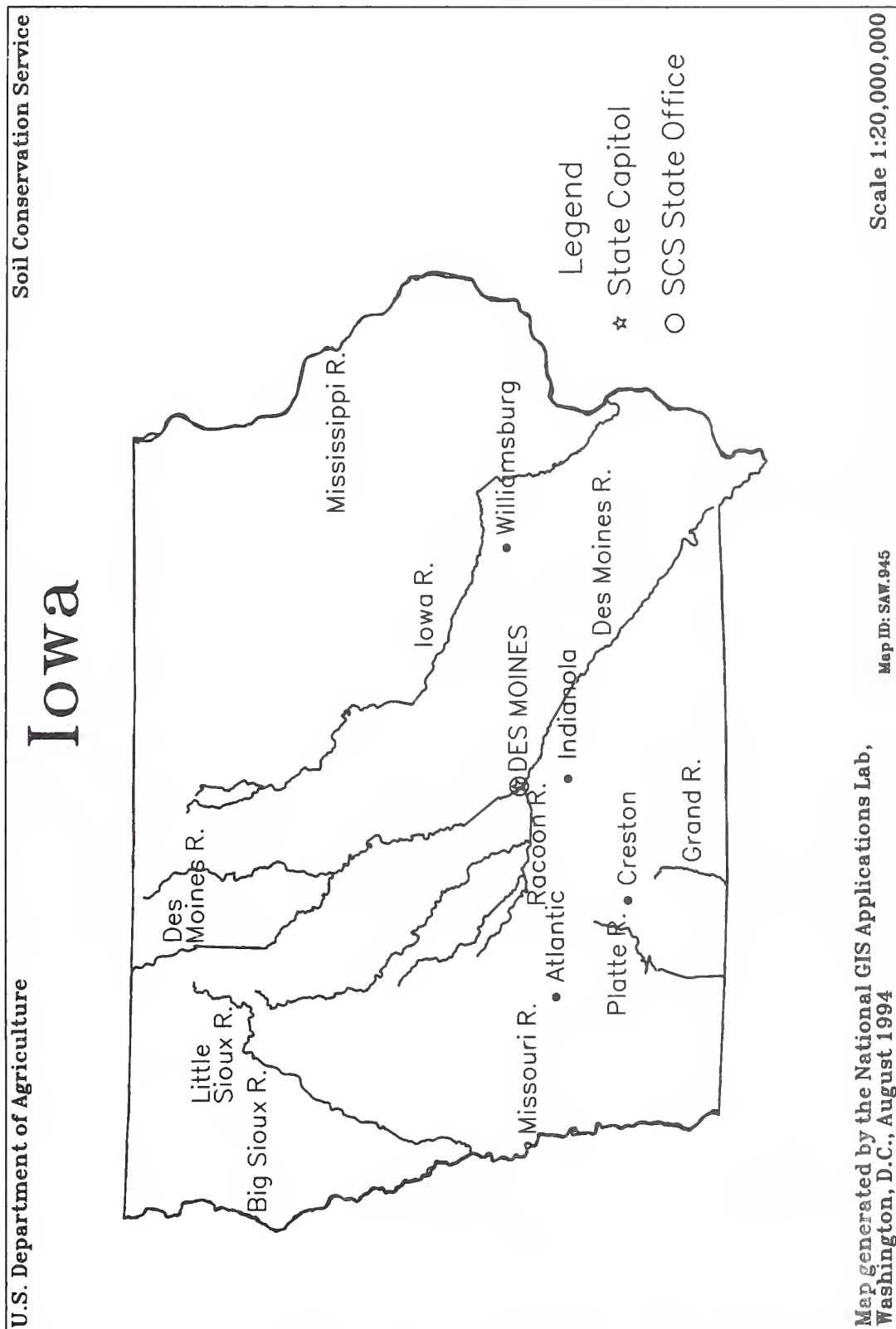
Levee repairs made up only about ten percent of the requests. As was the case in most of the flood states, the amount of attention and interest from Washington and the national media tended to outweigh the actual importance of levee work when compared to other tasks.²⁵⁴ Under the guidance of Iowa's Governor, Terry Branstad, staff from the Service met weekly with personnel from the Corps, FEMA, state, and other agencies in Des Moines to discuss problems and progress in levee repair. Water Resource Planning Staff Leader James M. Reel was the initial SCS representative, then EWP Coordinator Marty Adkins took over his duties. At these meetings, agencies exchanged lists of repair requests, many DSR's ruled ineligible by one agency were passed on to another, and conflicts over jurisdiction and funding were resolved in a relatively informal manner. The meetings continued on a bi-weekly basis into the spring of 1994. Utilizing the supplemental funds provided in early 1994, SCS held a sign-up for levee and other types of repairs. The levee repairs were primarily at sites rejected by the Corps.²⁵⁵ SCS in Iowa planned to repair about twenty additional levees.

²⁵² It is important to bear in mind that one contract may cover repairs at several sites. These sites are combined under a single cost-sharing agreement with one sponsor.

²⁵³ The increased volume and speed of water caused many streambanks to erode away. This was especially prevalent around bridges or other structures that restricted the course of the water. In other cases, the streambed eroded away, thus lowering the bed by several feet and creating a sudden-drop off in the stream (a "head-cut"). This shelf would erode its way upstream and undermine roads and bridges. SCS often responded by placing rock or concrete in the streambed in order to create a "permanent" waterfall that would not move further upstream.

²⁵⁴ SCS staff in Iowa stressed that their levee repair work and cooperation with the Corps was generally good, except when the national level of the Corps countermanded local agreements or the Washington staff of SCS attempted to "micro-manage" their work. These disputes must be seen in the context of the search for consistency by staff in Washington versus the drive to respond quickly to local needs seen by staff at the state level.

²⁵⁵ These were the levees on drainage areas of over four hundred square miles.



In order to keep pace with the great demand for engineering services, SCS relied upon computer-aided design (CAD). The engineering offices in Atlantic and Williamsburg, as well as the EWP Center in Indianola, all had trained staff on hand to use Versacad software. As a result, it became very easy to exchange, modify, and make consistent construction plans throughout the state. It also saved time by allowing engineering staff to select portions of previous designs and paste them into new projects. This capability was especially useful in some of the more complicated projects such as streambank and streambed stabilization around bridges.

In both the EWP efforts and more routine conservation work, perhaps no single job is as important in SCS as that of the district conservationists (DC). They are the employees who manage the field offices and work most closely with farmers and other landowners across the country. District conservationists have the most in-depth knowledge of local economic and environmental conditions, local media, and local politics. One individual, district conservationist Paul Goldsmith of Union County in south-central Iowa, illustrates the role of the DC in the EWP effort. He described his task as primarily that of a liaison between the county government and the EWP office in Indianola. His specific tasks included notifying the local newspapers about the emergency program, meeting with county government officials to help explain the program, checking damage sites, helping sponsors apply for assistance, and working with the county engineer on plans for repairs. The majority of the EWP work in Union County was to protect bridges and secondary roads. The county engineer provided the sponsor's portion of the cost-share payment through survey, administrative, and inspection services. In these cases, SCS's main role was to insure that the construction work met Service standards. Another important aspect of Goldsmith's work was ASCS's Emergency Conservation Program (ECP). The Service supplied technical assistance for over four hundred ECP jobs. ASCS, in turn, provided cost-sharing aid to landowners so that they could implement SCS's suggestions.

STATE Iowa		PROJECT Graybill Creek	
BY Johnson/REC	DATE 10/23/93	CHECKED BY W. Morrison	DATE 11/03/93
SUBJECT Survey Points Plot			SHEET 4 OF 18

BENCH MARK		
NO.	ELEV.	DESCRIPTION
TBM X	200.00	X Painted on Southwest corner of Bridge

Right Bank

Left Bank

Flow

Edge Water

60" C.M.P.

24" C.M.P.

County Road

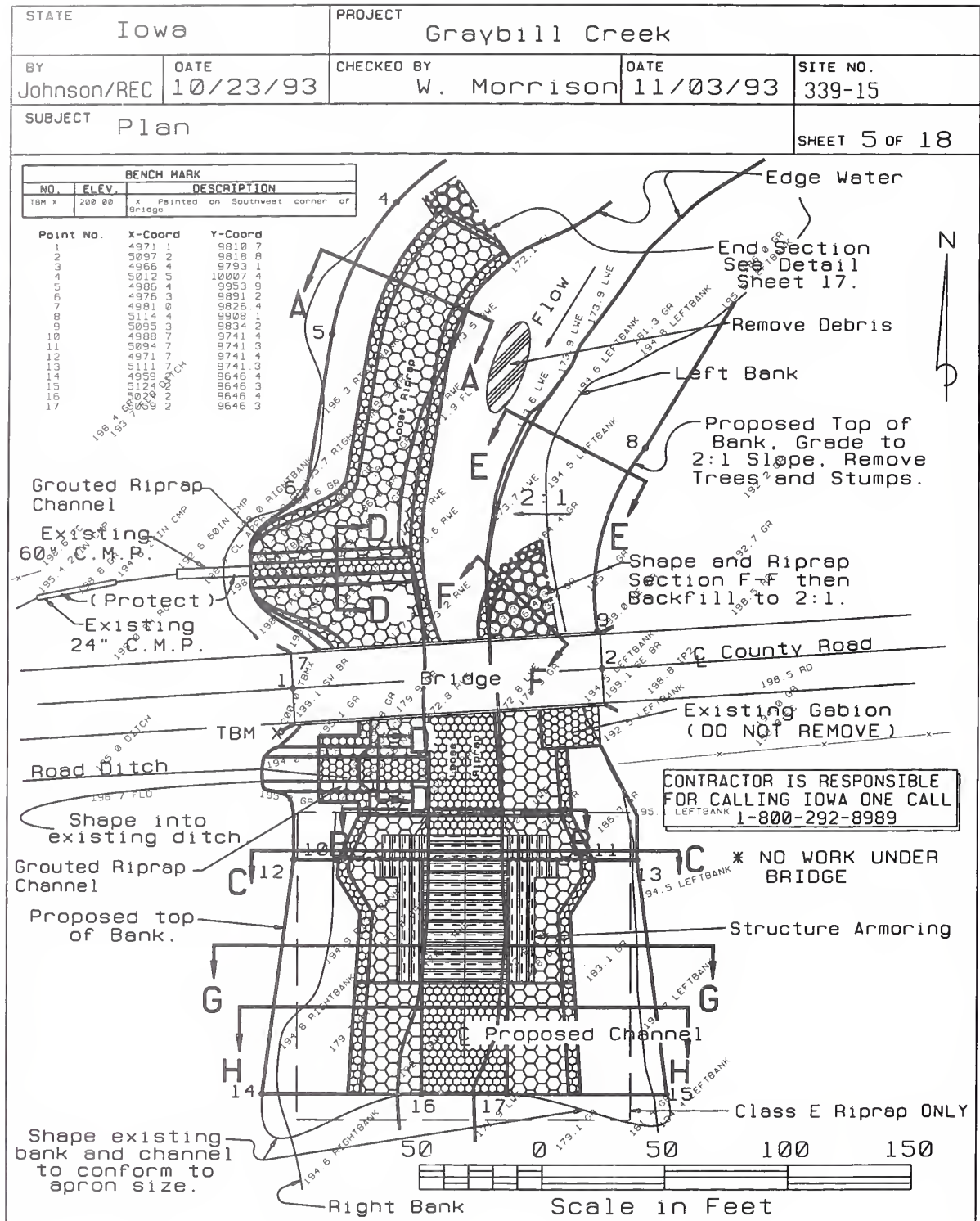
Existing Gabion (DO NOT REMOVE)

CONTRACTOR IS RESPONSIBLE FOR CALLING IOWA ONE CALL 1-800-292-8989

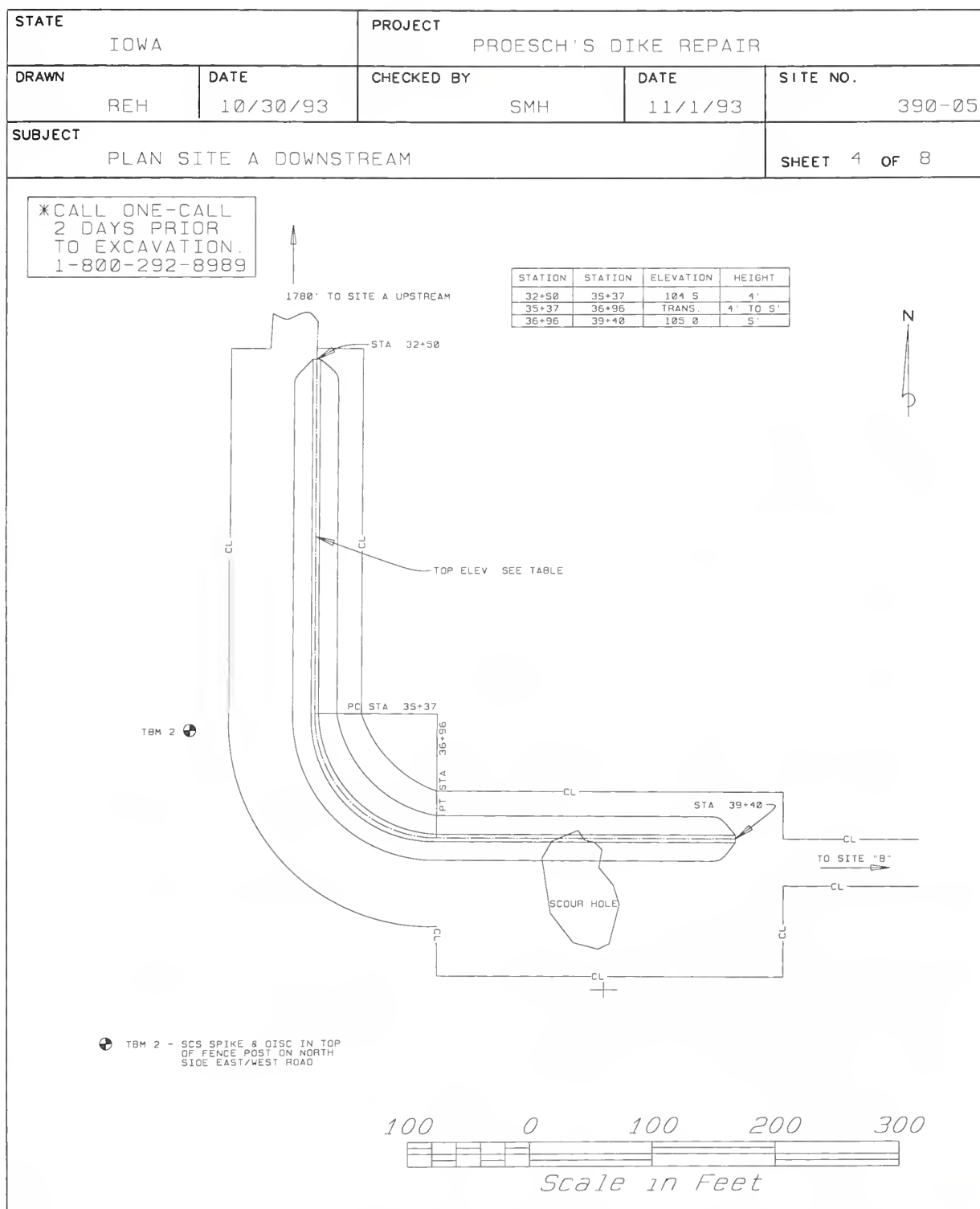
Scale in Feet

North Arrow

An Emergency Watershed Protection project. The above diagram shows the situation on Graybill Creek in Iowa as floodwaters went down. Streambank erosion, especially on the right bank of the creek, threatened to undermine a bridge.



Above is the SCS plan, prepared using CAD, for the repair of flood damage on Graybill Creek. Although the amount of work required here was extensive, it cost much less than replacing the bridge.



A levee in need of repair in Iowa. Although the public image of levee breaks and their repair was shaped by television news pictures of massive flooding along the Mississippi and Missouri rivers, the Service's EWP efforts generally focused on work along tributaries.

Even as SCS assisted the SAST efforts to compile data on the success or failure of soil conservation measures and small watershed projects in limiting flood damage, local anecdotal reports were positive.²⁵⁶ Lou Waite, SCS Technician in Iowa, has provided some interesting examples of how SCS projects benefit specific landowners and communities.

Harold (Shorty) Ray says that walking through the buffer strips on his Cass County farm feels like "walking on marshmallows". This is due to the soil caught and held by the grasses, and kept from washing down the hills into Indian Creek or Turkey Creek and floating away on the Nishnabotna River.

His wife, Shirley, confided that at first she and her husband felt the twenty-five acres put into the buffer strips was quite a loss of valuable cropland. "We had to pay for the seeding, the gas to operate the machinery and so forth," she said, "and knew we wouldn't be harvesting a cash crop on those acres."

But after the excessive rains of this year, the Rays realized the value of that particular conservation measure. "This year, with all the rain we've had, the run-off was greatly reduced from what it used to be."

Structure B-3 is a dam built on the Mill-Picayune Watershed through SCS's P.L. 566 program. It was built to control erosion on the lands containing the two creeks for which it was named. But it is also an outstanding example of how conservation benefits not only farmland, but recreation areas and natural habitats. The area around B-3 is known today among the residents of Dunlap as "Pleasant View Park."

After the 1993 flood, Dunlap mayor Martin Smith said, "First, we wouldn't have had the lake without SCS constructing the dam. And, if we hadn't had the dam, flooding like we have seen this summer would have caused terrible damage in town."

²⁵⁶ SCS staff in Des Moines said that less than one percent of the 2,250 Small Watershed Program structures in that state suffered significant damage. Some of those involved in the Small Watershed Program felt frustrated that the overall success of the program, especially its structures, was not being relayed to the public at large or to Washington policy makers. They also struggled to make clear the difference between the small watershed projects and the larger-scale work by the Corps of Engineers.

The 149 landowners in Shelby County's Long Branch Watershed, another P.L. 566 project area, first became very aware of the benefits of watershed protection after record rainfall in 1990. Farmer Eugene Monson said, "I thought that was great, but this year, when we had the worst flooding in the history of the county, the water in the [Long Branch] Creek was two to three feet below bank height. Furthermore, my terraces were still half to three-fourths full of water twelve hours later. These facts speak for themselves." Monson also credited the increase of no-till in the watershed and the five hundred or so acres of CRP with reducing the volume and retarding the velocity of the heavy rainfall run-off.

Francis Ballou, farmer and SCS District Commissioner, has been involved in the Troublesome Creek Watershed project since construction began in 1974. He recalled, "Back when the structures were put in the Troublesome Creek Watershed, I said I would like to see what a heavy rain would do, once they were in place. I was remembering what terrible devastation we had in 1958, and wondering what the difference would be. Well, this year, I finally got my wish--not that I was asking for that kind of trouble. But unlike 1958, Troublesome Creek barely went out of its banks after we had eleven inches of rain in one night! Not only were all the structures filled, but it took two or three days for the water to go out. They held all that water with no problems! It was really gratifying to see."²⁵⁷

These examples indicate two things: first, the flood improved the Service's public image. Second, specific local benefits were key to forming views of SCS and its work; small structures were the most visible and easy way to measure the Service's success or failure.

Besides performing the most EWP work, Iowa had the second greatest response to the Emergency Wetlands Reserve Program (EWRP) in the wake of the flood.²⁵⁸ Perhaps the most important single incident of the EWRP was the purchase of easements for about three thousand acres of land along the lower reaches of the Iowa River.²⁵⁹ This wetlands buy-out was important for several reasons. First, it was widely publicized by SCS, USDA, and the press. The Secretary of Agriculture was interested enough in the issue to visit Louisa County in the fall of 1993. Besides extensive local newspaper and agricultural press coverage, the Levee District 8 buy-out was cited as an example of the success of the wetlands program in the national press. Second, the project illustrated the

²⁵⁷ Materials gathered from the Public Affairs Staff at the Iowa state office. Lou Waite has written a variety of interesting reports about SCS and its effects upon local communities.

²⁵⁸ See the section on "Wetlands" for details about each state's participation in the program.

²⁵⁹ This was also known as the Levee District 8 buy-out.

increasingly important role of private organizations in helping achieve conservation goals. Their cooperation stemmed from shared interests in wetlands and the environment, the limited funds available to SCS, and the flexibility which private organizations possess. Many farmers were willing to offer the easement to SCS only after being assured that they could sell the title (to the Iowa Natural Heritage Foundation) and be free of local tax obligations (assumed by the Fish and Wildlife Service).²⁶⁰ Third, this was the clearest case where the repair of a levee was prevented due to the availability of an alternative. In fact, prior to the easement purchases, the Corps had already drawn up plans for the repair and was preparing to award a contract. The Army Engineers had estimated that repairing the levee would cost \$700,000 to \$800,000.²⁶¹ Local Corps staff proved eager to cooperate. They agreed to delay their contracting process while SCS, FWS, and private groups organized the Levee District 8 buy-out.²⁶² The easement value determined by the state committee in Des Moines was \$683 per acre. This amount was supplemented by funds from private organizations under the leadership of the Iowa Natural Heritage Foundation. They arranged to add funds to the SCS easement offer in order to buy outright title to the land. The land was then donated to the FWS. The levee district itself was dissolved as a condition of the purchase of easements and land titles. The successful Levee District 8 buy-out was a model for future wetlands or environmental easement programs. It also illustrated the difficulty of such endeavors and the need for coordination between landowners, state and federal agencies, and non-government organizations.

Each state faced different barriers to EWP work. The lack of construction materials was a problem in Iowa. Prices for riprap, the rock used to stabilize streambanks quickly, rose after the flood. Riprap is generally the cheapest way to stabilize streambanks, since it involves placing rock on a slope following bank-shaping work. It is not, however, always feasible on steep slopes.²⁶³ Also, it was difficult at times to find rock that met SCS standards. For riprap, the key qualities are the hardness of the stone and its size.

²⁶⁰ Bruce Mountain, who oversaw the Iowa Natural Heritage Foundation's work on the Levee District 8 buy-out, stressed that the ultimate success of this project hinged on the flexibility of the government agencies involved. Agencies had to be willing to put aside conflicting rules on issues like easements. The Fish and Wildlife Service was particularly interested in Levee District 8 because it could serve to expand the Mark Twain Wildlife Refuge.

²⁶¹ Cynthia Mayer, "Turning Farms into Wetlands," *Philadelphia Inquirer*, December 29, 1993. Jim Patrico, "Practice Makes Perfect," *Top Producer* (April 1994): 42-43.

²⁶² Overall, the effort led by the White House to provide alternatives for levee rebuilding in 1993 and 1994 was a failure. As mentioned in the previous section on levees, the only viable alternative was the EWRP, which had no rules until late November of 1993. Also, much of the land in the floodplain did not meet the criteria for wetlands. Most of the offers under the EWRP were for relatively scattered plots, not an entire levee district (as was the case in Louisa County).

²⁶³ In those cases, more expensive alternatives such as gabions may be necessary. Gabions are large metal baskets which are placed along the streambank then filled with stone. They can be stacked and are most appropriate in areas where the slope is steep.

The Service often uses standards for construction materials set by the state highway department. Since many contractors involved in EWP work have experience in road construction or maintenance, they are already familiar with the standards. SCS responded to the shortage of quality riprap in four ways: First, employees simply rejected some stone, thus setting the tone for better quality materials from all contractors. Second, staff went to the source and inspected stone at the quarry. Third, SCS ordered some contractors to dump their riprap and sort it for the acceptable material. Fourth, the problems of cost, quality, and availability led to innovative use of different materials. Slabs of concrete, three feet square and one foot thick with a metal hook for lifting, were written into the construction specifications for some sites. Grouted riprap and gabions were used at other locations.

One requirement SCS and other federal agencies faced was assuring adequate representation of woman- and minority-owned firms. These are sometimes called "8-A" firms because of they are covered under a program mandated by the Small Business Investment Act of 1953 (as amended by P.L. 95-507 in 1978). Staff in Iowa and other states pointed out some difficulties in finding suitable firms under the 8-A program. First was the general shortage of woman- or minority-owned companies which do earth-moving or construction work in the Midwest. Second was the great demand for contractors to perform work for the Corps, SCS, FEMA, states, counties, towns, and individuals as the flood waters began to recede. At times, the Service's contracting officers had difficulty finding enough firms of any type to bid on EWP jobs. SCS contracts were generally smaller and shorter-term, and thus less sought after, than work offered by agencies like the Corps of Engineers. Although not all were part of the 8-A program, Iowa did better than most in locating and contracting woman-owned firms for emergency repair work. By early February 1994, ten of the 126 contracts valued at over \$25,000 and seven of the seventy-one contracts valued at less than \$25,000 were with woman-owned firms.

By early 1994, some of the staff in Iowa felt in danger of being overwhelmed due to the combined workload of flood recovery, the animal waste management program, the Small Watershed Program, and conservation compliance activities.²⁶⁴ State staff suggested an innovative response to these demands by modifying SCS's role in EWP:

²⁶⁴ Conservation compliance is the work required to assure that farmers who received USDA benefits had in place a conservation plan as mandated by the 1985 and 1990 farm bills. Iowa is the largest pork producer in the United States. The animal waste management program is the effort to reduce runoff which harms water quality.

We are developing plans to change the role of Iowa SCS from that of a provider of technical and administrative services to that of a funding agency that also provides technical and administrative support. Project sponsors will be empowered as partners, providing engineering and contracting functions. SCS will provide construction funds, engineering and contracting support, and take steps to ensure quality control. This new mode of operations should allow for more timely completion of EWP repairs, lessened impacts on other SCS program areas, and the development of a new tool for program delivery in future short-term events.²⁶⁵

In other words, the local sponsor's cost-share would be to provide the administrative and engineering services required for the repair. The Service would then fund the actual repair work and spot-check to assure that engineering standards were maintained. The Service would take on the role of a granting agency. Iowa's EWP effort had been moving slowly in this direction as SCS staff developed confidence in local sponsors' abilities. Not all state offices in the Midwest were eager to try this approach. First, many did not feel that their workload justified the change. Second, some staff members, particularly those with engineering backgrounds, were less than enthusiastic over losing control of project designs. Their question was: What would or could SCS do if the repair was substandard or used substandard materials? Third was the issue of administrative control of funds and assurances that contracting practices would be fair. The attempt to re-invent the relationship between SCS and local sponsors showed great potential, but it will be some time before a complete evaluation can be made.

²⁶⁵ "Iowa Emergency Watershed Protection (EWP) Program-July 1993 through Present," Iowa State Office, March 1994.

Kansas and Nebraska

Most damage in Kansas was in the northeast quadrant of the state. The SCS estimated that about three million of the state's twenty-nine million acres of cropland required restoration work after the flood. Jim Wallace, state conservation engineer and the employee who managed most of the day-to-day flood recovery work in Kansas, stated that up to thirty thousand acres of prime farmland were washed away, severely scoured, or covered with deep sand. In response to these problems, SCS in Kansas held a sixty-day sign-up for EWP assistance beginning in August of 1993. By December, the state office in Salina had already approved 249 of over seven hundred DSR's.

The most common EWP work was removing debris from around bridges and sediment from streambeds and drains. Although these were often small projects costing less than \$20,000, they provided immediate local benefits, such as protecting a bridge or county road. The most critical of the approximately eighty exigency projects focused on streams plugged with debris at bridges, caved-in banks, and eroded bridge abutments. Under these circumstances, even relatively minor rainfall would lead to more flooding and thus threaten near-by infrastructure. Kansas completed most of the exigency work by the end of 1993. Hundreds of less critical projects, however, remained in 1994.²⁶⁶ By the end of June 1994, SCS in Kansas had received 877 DSR's. Of these, 548 were eligible for assistance: 355 for silt/debris removal, 108 to repair erosion damage, and eighty-five for levee repair. The work was valued tentatively at over \$11 million. Well over half of the eligible EWP jobs were either completed or in progress by mid-1994. Most of the DSR's that had been rejected lacked sponsorship, lacked public benefits, or were the responsibility of another agency.

Many of the problems associated with levee repair in Missouri were also present in Kansas, albeit on a smaller scale.²⁶⁷ Most of the major levee breaks were along the Missouri, Republican, Kansas, and Solomon rivers. Kansas was part of the Corps' Kansas City District, which many sources claimed was the least likely to approve levee repair. As was the case in several of the flood states, SCS held a supplemental sign-up for levee repair in April of 1994. During this round, over eighty requests for assistance were received. The vast majority of these were ruled ineligible due to the lack of proper sponsorship or public benefit. Many of these rejected levees had already been turned

²⁶⁶ Much of the information in this section comes from press releases prepared by the Kansas state office under public affairs officer Tim Christian. See also newspaper reports such as Steve Painter, "Scarred Fields Testimony to Floods' Force," *Wichita Eagle-Beacon*, October 17, 1993.

²⁶⁷ See the sections "Missouri" and "Levee Repair" for more detailed information on this issue.

down by the Corps and the Economic Development Administration. If the Service refused to assist, there was almost no chance of federal aid.

Newspaper reports made clear that many farmers, frustrated by the pace or the uncertainty of federal assistance, intended to fund and make their own levee repairs if necessary.²⁶⁸ According to EWP rules, SCS was to provide cost-sharing and technical assistance for repairs only in those cases where sponsors, such as local drainage or levee districts, lacked the financial resources to do the work themselves. It would seem at first glance that any entity that funded its own repair had more money than another which did not. The situation, however, can be more complicated than this. Districts or individual landowners may be willing to pay for repairs because they are desperate to get land back into production (perhaps they are more dependent upon the flood-damaged land for their livelihood) or are more willing to make personal sacrifices to raise assessments, not necessarily because they are "richer" than others.

Interest in alternatives to levee repair, such as the WRP and EWRP, was limited in Kansas. The state had not been part of the WRP pilot program; the first experience the state's landowners had with the easements was with SCS's emergency program. The first EWRP sign-up was held in December of 1993. The state was divided into three regions for easement offers: eastern Kansas--\$650 per acre, central Kansas--\$560, and western Kansas--\$350. Thanks to supplemental funds provided in early 1994, a second sign-up was held from April through December of 1994.

As was the case in many of the flood states, the Service in Kansas attempted to relay to the public the benefits of conservation compliance and small watershed projects. State conservationist James Habiger said that, by the fall of 1993, fifty-nine percent of the farmland in Kansas was under conservation tillage.²⁶⁹ This was a result of efforts to insure compliance with the provisions of the 1985 and 1990 farm bills, which made the implementation of a conservation plan a requirement for receiving certain USDA benefits.²⁷⁰ Conservation tillage not only controls erosion by protecting the soil from the impact of falling rain during years of average rainfall, but it also helps slow run-off during times of heavy rain, as was the case in 1993. Slowing run-off, in turn, lowers local flood peaks. Conservation tillage includes no-till, ridge-till, and crop-residue

²⁶⁸ For a detailed look at one drainage district and its conflict with the Corps over levee repair eligibility, see Jim Suber, "Farmers Race Against River, Red Tape," *Topeka Capital-Journal*, April 5, 1994. Landowners claimed that they were never informed that they had been taken out of the Corps' levee repair program in the 1980s.

²⁶⁹ "KS Farmers Using More Conservation Tillage," *Farmtalk* (September 22, 1992): 121.

²⁷⁰ In Kansas, 84% of the farmers were implementing their conservation compliance plans when the floods hit in 1993.

management. Other popular methods of protecting the soil include terraces, grassed-waterways, and trees.²⁷¹

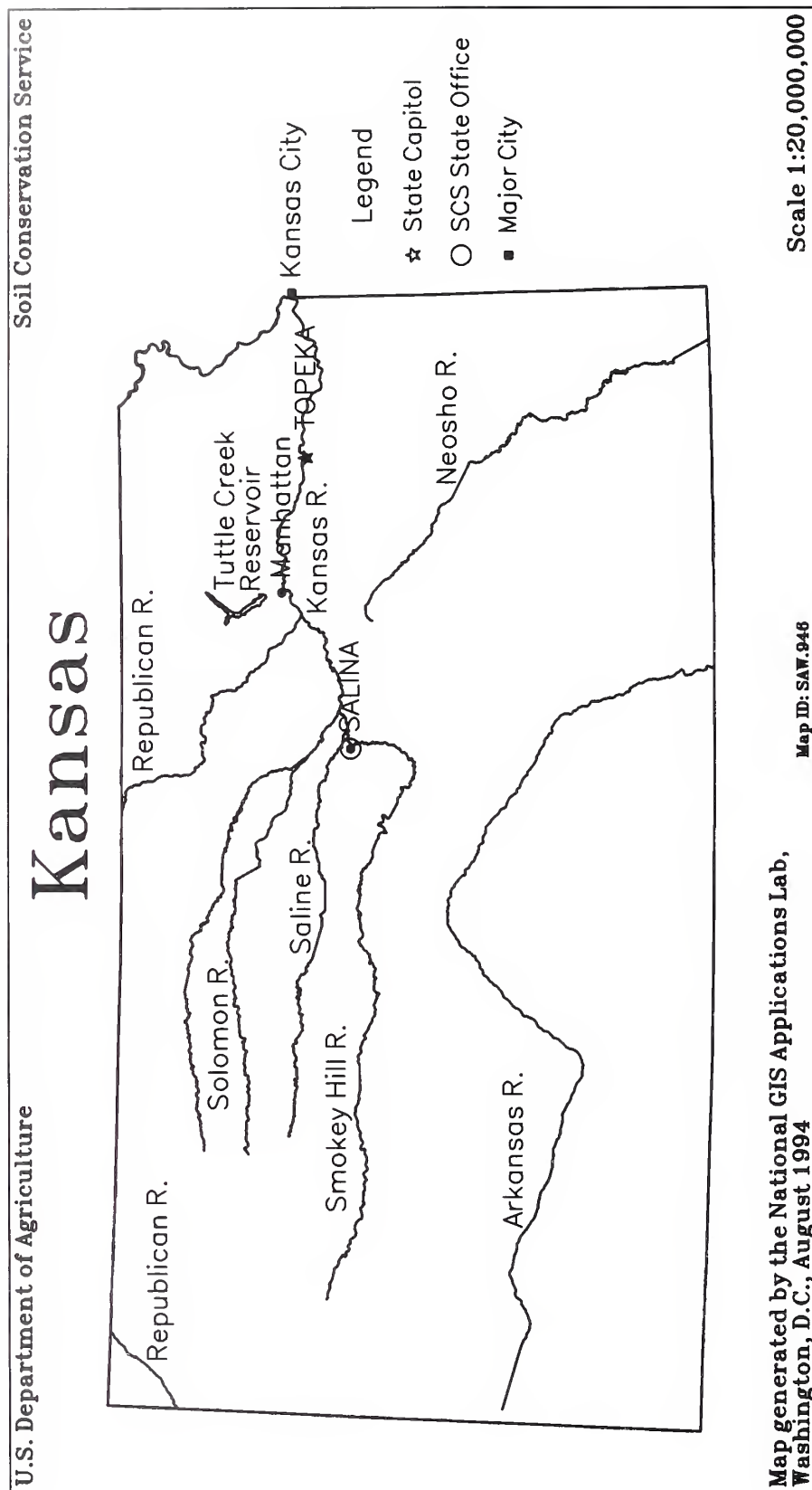
The Small Watershed Program (P.L. 566) has been popular in Kansas since its inception in the mid-1950's. Organizations like the State Association of Kansas Watersheds have consistently supported the Service's efforts in this area. SCS personnel credited these projects, which included measures ranging from small dams to land treatment practices, with preventing greater flood damage. Watershed work was also the focus of public affairs efforts in the Sunflower State. Over seven hundred dams have been built in Kansas since the 1954 law which authorized the program. The complete watershed projects, such as Nebo Creek, Frog Creek, Cross Creek, Irish Creek, Upper Verdigris, and White Clay-Brewery-Whiskey were all credited with reducing local flood damages by sixty-five percent or more. Many sources compared damages in 1993 to the worst previous flood, that of 1951, and emphasized that water levels rose and fell at a slower rate after the P. L. 566 work was completed.²⁷² For example, the Lyons Creek Joint Watershed Number Forty-one, with thirty dams protecting almost twelve thousand acres, provided about \$250,000 worth of benefits in damages prevented in 1993. The Sand Creek watershed project was credited with preventing \$286,000 worth of damages. A project now almost forty years old, the Switzler Creek Watershed, allowed only minor flooding in the town of Burlingame. A more recent accomplishment, the Turkey Creek project, was completed only in 1992. It covered eight thousand acres; its dams held and then slowly released waters that would have caused flooding along the creek in the past.

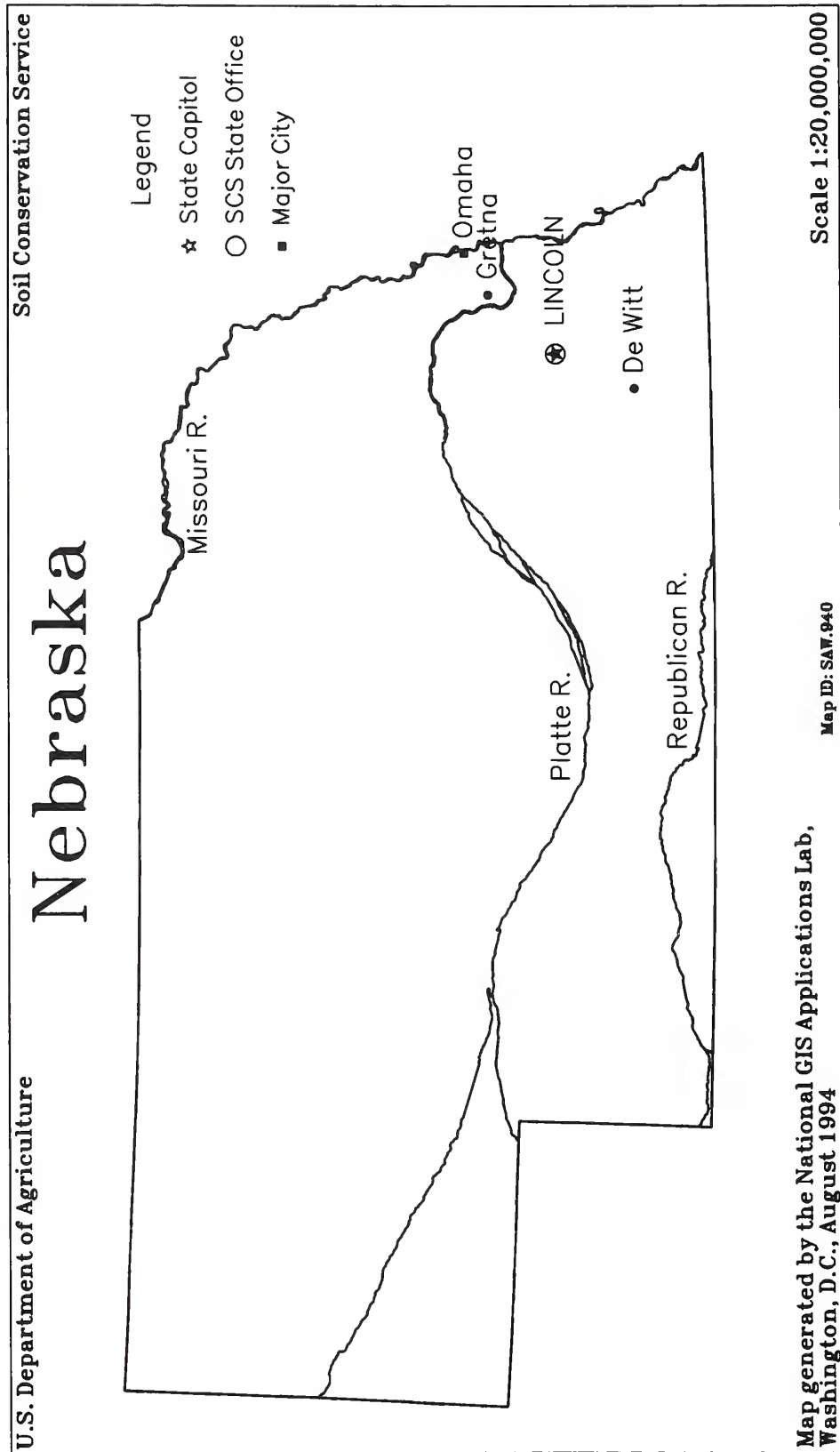
Directly to the north, Nebraska's disaster came from two sources: ice jams in the Platte River during the spring and heavy rainfall in the spring and summer. The floods in Nebraska began in March of 1993, earlier than almost any other place in the Midwest. Even before the rainfall of spring and summer, some farmers determined that they would be unable to plant in some areas of eastern Nebraska or that their harvests would be below average.²⁷³ Eventually, fifty-one counties were declared disaster areas by the federal government. Most flood damage was in the southern and southeastern part of the state.

²⁷¹ See the section entitled "Flood Control and Floodplain Management Debates" for information on how the Interagency and SAST reports evaluated the flood control or prevention values of various SCS programs.

²⁷² Tim Christian, SCS Public Affairs Specialist, "Watersheds Save Property, Money," *Abilene Reflector-Chronicle*, April 29, 1994.

²⁷³ James Ivey, "Farmers May See Tax Relief if Floods Prevent Crops," *Omaha World-Herald*, March 27, 1993.





Overall, the extent of damage which was eligible for EWP assistance in Nebraska during the summer of 1993 was less than in states to the south and east. Even in late July, the state office had received no reports of failure of levees, dams, or channels.²⁷⁴ As was the case in Kansas, Nebraska staff emphasized the benefits of the Small Watershed Program. One P.L. 566 success in the Cornhusker state was the Swan Creek project area, where eleven SCS-designed dams contained water from sixty thousand acres of drainage above the town of Dewitt, thus reducing flood damages dramatically.²⁷⁵

As the requests for assistance began to roll in, however, SCS devoted its initial flood recovery efforts to twelve Natural Resource Districts in the eastern part of Nebraska. A meeting was held in early August which brought personnel from all these districts and SCS together to begin the EWP process. EWP Teams were established for each district. In some areas, Service personnel used National Guard helicopters to survey damage. By November of 1993, thirty-two projects were in progress. In total, the Service approved sixty-nine requests for assistance (of eighty-two received). The work was split between debris removal (forty-four percent) and erosion control (fifty-six percent). Nebraska did not require outside engineering assistance for its EWP efforts for two reasons. First, the engineering staff at the state office and in the field had obtained the type of experience vital for flood recovery work through their Small Watershed Program projects. Second, the use of a computer-aided drafting and design system (CADD) increased staff productivity.

One of the largest EWP projects in Nebraska was the streambank stabilization work done on the Elkhorn River near Gretna, a town about twenty-five miles southwest of Omaha. Portions of the banks of the Elkhorn eroded four hundred feet in 1993, threatening homes and eating away at valuable farmland. Ice jams early that year on the river caused water to back up. This problem was exacerbated greatly by the heavy rainfall in mid-1993.²⁷⁶ The Service worked with the Papio-Missouri River Natural Resources District and Sarpy county to build fifteen jetties and install other streambank protection measures costing almost \$250,000.²⁷⁷

²⁷⁴ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #15, July 21, 1993.

²⁷⁵ Scott Hoag, Jr., Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #19, July 27, 1993.

²⁷⁶ EWP program rules stressed that SCS was to repair structures back to the pre-disaster conditions only. In situations such as this, however, it can be difficult to determine what was damaged by ice jams and what was harmed by rainfall or flooding a short time later.

²⁷⁷ C. J. Hutchinson, "Project Proves Itself Already on Elkhorn," *Omaha World-Herald*, March 3, 1994.

As was the case in other states, complaints about federal responsiveness to levee repair requests in Nebraska were frequent. Also, misunderstandings over the change in Corps policy in 1986 led to a great deal of uncertainty over responsibility for repairs both among the public and in government. One particularly sensitive point was that when any levee was repaired by a federal agency other than the Corps, that entity became responsible for all future repairs.²⁷⁸ For the Service in Nebraska, however, this was not a major problem as only one levee was eligible for repairs under the EWP program.

In Nebraska, the emergency wetlands effort focused on thirteen counties in the eastern part of the state, that is, those areas hardest hit by the floods. The state office determined that an easement value of \$600 per acre would be offered to landowners who wanted to participate in the program. The first sign-up was in December of 1993. SCS expected and received relatively few offers from landowners; most opted to restore the productivity of the land themselves. While many farms suffered crop damage due to excess moisture, fewer met the key EWRP criteria of having been inundated.

The experience of Nebraska also highlighted the limitations of the EWP program. As one article pointed out, returning agricultural land to profitability meant much more than repairing the physical structures which kept flood waters off the land; it also required restoring the topsoil which had been washed away by floodwaters.²⁷⁹ Work of the latter type, which usually focused on individual farms, was not part of EWP, but was covered by the ECP, which combined SCS technical expertise and ASCS funding. While farmers received aid for crop losses in 1993, the long-term economic health of many farms remained in doubt due to high land restoration costs and lowered productivity.

²⁷⁸ Jim Smiley, "Landowners Welcome Funding for Repairs to Broken Levees," *Omaha World-Herald*, November 21, 1993.

²⁷⁹ Art Hovey, "Flood-Stolen Soil not Returning," *The Lincoln Star*, December 1, 1993.

Missouri

Missouri was one of the states hardest hit by the floods of 1993. Except for a few counties in the Ozark country along the southern border with Arkansas, President Clinton declared the entire state a disaster area. As reported in August of 1993, over three thousand businesses were economically damaged by the flood, twenty-five thousand people were laid off, and three thousand homes were destroyed. Damage to an estimated 1.3 million acres of cropland was expected to have ripple effects on the state's economy through the industrial and transportation sectors, possibly resulting in losses of half a billion dollars and seven thousand jobs.²⁸⁰ As the water slowly receded in the fall, the SCS added its own statistics to illustrate the devastation in their state:

- 3.1 million acres flooded
- 1,700 miles of ditches blocked with debris
- \$250 million in crop losses
- 60 percent of the cropland (455,000 acres) in the Missouri River floodplain damaged by sand deposits and scouring
- 59,000 acres covered with two feet or more of sand
- 465 breaches in Missouri River levees (along 498 miles of river).²⁸¹

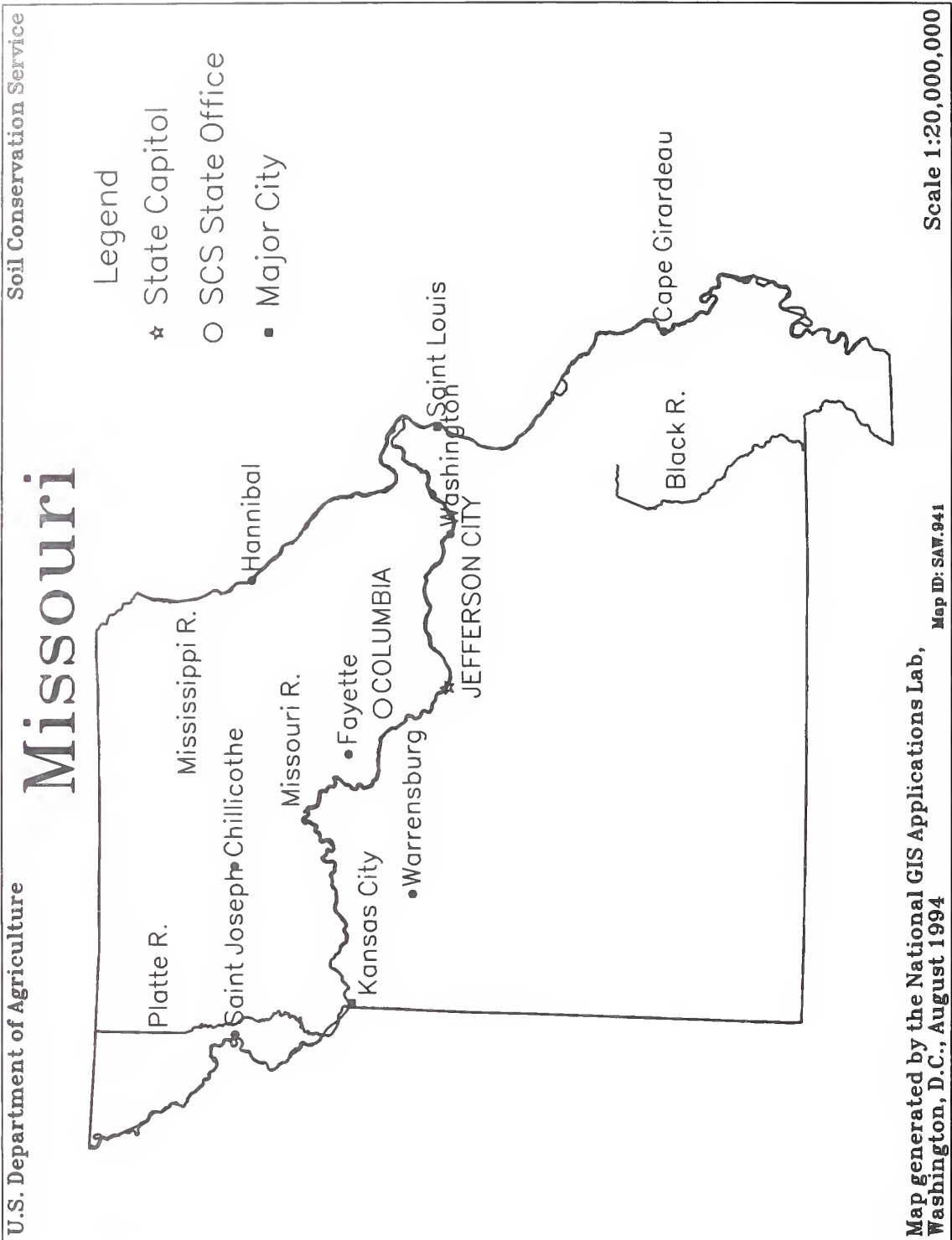
It is in the context of the economic effects of this disaster, not just the environmental, that SCS's response must be considered. The Service's EWP work was a vital component in helping the state regain its economic footing.

Initially, staff in the SCS state office in Columbia, Missouri, estimated that it would require \$4 million to repair upland areas (terraces, ponds, etc.) and \$10.6 million for ditch repair. They stated that 364 miles of ditches were plugged with debris and 1,262 miles were filled with sediment. More than any other state in the flood area, Missouri relied upon levees to protect industry, homes, and valuable agricultural land. SCS first estimated that \$6.6 million was needed for upstream tributary levee or secondary levee repairs.²⁸² Approximately 2,091 levee breaks plagued upstream tributary river systems or secondary levees on major rivers. The average break was 1,916 feet long. At this time, SCS in Missouri was at least considering work on secondary levees on

²⁸⁰ Statement of Abner Womack, Co-Director, Food and Agricultural Policy Research Institute, University of Missouri, in *Federal Response to the Midwest Floods of 1993*, 32.

²⁸¹ "Impacts of the 1993 Flood on Missouri's Agricultural Land," Soil Conservation Service, Columbia, Missouri, October 1993. See also, Keith Schneider, "Legacy of '93 Flood: Sand, Sand, and More Sand," *New York Times*, June 9, 1994.

²⁸² Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #33, August 19, 1993, and Report #36, August 30, 1993.



major rivers. The number of potential levee repairs quickly soared beyond the Service's funding. The Corps reported that of 795 non-Federal levees previously in the Corps system, only 150 were eligible for repair under their auspices.²⁸³ This increased the number of citizens seeking help from the Service

Despite high water that hampered EWP efforts, by early December about 450 DSR's had been completed in Missouri--about fifteen percent of the total DSR's completed by SCS in the nine flood states. Over half of these were for levee repair. Also important were requests for assistance for debris removal. Many streams were blocked due to trees, sand, and man-made debris (including in at least one instance a mobile home). As was the case with breached levees, debris threatened to cause more flooding in the event of further rainfall.

Missouri proved second only to Iowa in the number of Damage Survey Reports received (1,182), the number of eligible projects (510), and the dollar amount devoted to EWP efforts (over \$18 million). By July of 1994, well over half of the eligible projects (329) had already been completed. In the realm of levee repair Missouri stood out. Almost two hundred of the 452 total eligible repairs were in this state. Since SCS levee repair focused on the smaller tributaries, however, the average levee repair contract was less than \$30,000.

Even before the extent of flood damage became clear, the Service prepared to respond. In July of 1993, state office staff provided information to the public on the EWP program, its purpose, and eligibility requirements. By August, the framework for EWP work had been created. Under the overall supervision of state conservationist Russ Mills, the State Response Team was led by assistant state conservationist for Water Resources, Mike Wells.²⁸⁴ He organized an Emergency Operations Center in the same building as the state office under Ross Braun, water resources planning specialist. The Center coordinated the state's EWP efforts, maintained records of DSR's and applications for assistance, as well as handled contracting duties. It also served as a focal point for managing the work of SCS employees shifted from other states to assist with EWP work. For example, contracting specialists with experience in previous major disaster recovery work, including Hurricane Andrew in Louisiana, came to Columbia. When the Center opened, it contained a manager, three contract specialists, an

²⁸³ Edward J. Hecker, Chief, Readiness Branch, Operations, Construction and Readiness Division, Directorate of Civil Works, Corps of Engineers, "Memorandum for the Record."

²⁸⁴ For a brief overview of EWP plans in Missouri, see "Soil Conservation Service Opening Emergency Offices to Help Landowners Restore Pre-Flood Conditions," *Agriculture Tomorrow* (September 1993): 1.

administrative assistant, and two clerks. On September 1, 1993, a short EWP procedural handbook was published in order to guide SCS employees on administrative chores such as overtime and travel expenses, mobile telephone numbers for key staff, and duties at the state and local levels.

Normally, SCS activities in Missouri are divided into seven areas, each area encompassing ten to twenty counties. The state office set up seven Emergency Project Offices, most of which were in the same location as the area offices. In order to distribute more evenly the workload among areas and place offices closest to the greatest need for assistance, the area boundaries were modified. SCS combined the far southeast area, which suffered relatively little flood damage, with one to the north while parts of four areas were combined around an Emergency Project Office in the central part of the state. Each office had a staff which included a lead engineer who also served as the office manager, another engineer, a lead survey technician, a lead inspector, and a clerk. They could call upon specialists such as biologists, soil scientists, cultural resource coordinators, and other engineers. Finally, the local field offices played a vital role as the first point of contact for most citizens. Their duties included completing DSR's, assisting sponsors with the application process, and providing information to the local media.

Levee repair was a major concern in Missouri. Cordes Potter, civil engineer at the state office, was the Service's representative at FEMA's Disaster Field Office in Earth City (near St. Louis, Missouri). He worked closely with the Corps of Engineers in order to develop a unified approach to levee repair. SCS remained, however, unclear about how the Corps determined which levee districts were not in its program due to improper maintenance. Further meetings with Corps staff in Kansas City proved necessary. The Kansas City District had jurisdiction over the Missouri River basin from its mouth just north of St. Louis westward in an expanding triangle that covered about half of the state. Mike Wells presented Corps staff with several issues at a meeting in late September. First, it would be difficult to follow rigidly the 1986 Memorandum of Understanding between the two agencies since it was never put into effect. This echoed concerns raised by national headquarters staff.²⁸⁵ Second, the Corps threatened to refuse to repair any levee which the Service had dealt with. For example, as part of a small watershed project, SCS placed a single pipe through a levee in the Sunshine Levee District (west of Lexington along the Missouri River). The Corps stated that, according to its own rules, the entire levee could technically become an SCS responsibility. Also, the Service had performed some EWP levee repairs after the 1986 flood. Wells stressed that this work did not mean that SCS was "taking over" these levees or that the Corps should refuse repairs on that basis. SCS had neither the funds nor the intention of performing work on

²⁸⁵ See the previous section in this work, "Levee Policy."

mainline levees. He and Potter suggested a general division of labor which would give the Corps responsibility for all mainline levee work along the Mississippi and Missouri rivers, as well as the lower reaches of the Grand River. SCS would bear responsibility for repairs in the rest of the state. Such a division of labor did not exactly follow the four hundred square mile rule, but had the virtue of simplicity.

In early September, SCS distributed a press release which clarified its policy: "While the Soil Conservation Service will not repair levees in the floodplains of the Missouri, Mississippi, and lower Grand rivers, it will be responsible for levee repairs along all tributaries of those three rivers, as well as the Grand River itself upstream of U. S. Highway 36." Therefore, levees along the largest rivers remained the exclusive responsibility of the Corps. This situation soon changed as SCS suggested that it should repair some levees south of Route 36 which were more logically parts of the levee system above the dividing line. Then, in early 1994, Congress' supplemental appropriation provided the authority and funds for SCS to make repairs in the major river bottoms to levees rejected by the Corps of Engineers. As was the case in other flood states, however, the number of levees that met the criteria turned out to be fewer than expected and only a handful were repaired by SCS.²⁸⁶ Overall, however, through the efforts of the Corps, SCS, levee or drainage districts, and private citizens, most levees were restored to their pre-flood condition and location, despite recommendations made as far back as 1944 that levees be built as least fifteen hundred feet from the river.²⁸⁷

Sand deposits after floods along the Missouri River became another major problem for farmers and SCS. The sand was scoured from the river bottom and deposited on cropland in the floodplain as the water spread, slowed, then retreated to its original banks. The sand made the land useless for agriculture, a situation that was not unique to 1993. Rufus Terral wrote that after the 1935 floods, some farms were stripped of soil and others received sand and gravel deposits from two to twelve feet deep. The special plowing equipment needed to cut through this material to a depth of six feet and turn the soil underneath required five tractors in the 1930's.²⁸⁸ In early September of 1993, Missouri reported that many areas were covered with from one to five feet of sand.²⁸⁹ Even the national press discussed the problem. On September 13 an Associated Press report from Iowa highlighted the problems of sand and silt on farmland. About ten million acres of farmland was flooded--an area twice the size of New Jersey--causing an

²⁸⁶ See the "Levees" section for details on the 1994 repairs.

²⁸⁷ For more information on levee plans and floodplain management in Missouri, see Keith Schneider, "Legacy of '93 Flood: Sand, Sand, and More Sand," *New York Times*, June 9, 1994.

²⁸⁸ Terral, *Missouri Valley*, 92-94.

²⁸⁹ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Report #38, September 7, 1993.

estimate \$5 billion in crop damage. An agricultural engineer in Iowa estimated that for every acre with two feet of sand, six acres were required to work it into the soil in order to partially restore the land's productivity. This work was delayed time and again due to rains.²⁹⁰

Even before the water had receded enough for EWP work to begin in earnest, the Service's response to sand deposits combined a variety of disciplines. For example, in August the staff of the state office combined a variety of technologies in order to provide statistical data on flood damage. By analyzing colors and textures on an aerial video of the Missouri River floodplain shot by the FWS, the Resources Information Management Section under Bob Ball determined the rough percentage of cropland covered by sand and estimated the depth of that sand. Terry Barney of this section and Ken Vogt of the soils staff performed much of this analysis. (The attached map details this phenomena near Hartsburg, a small town near Missouri's state capital of Jefferson City.) They then extrapolated this data and were able to make estimates as to the total areas covered by sand as well as its depth throughout the floodplain, which is the heartland of Missouri's agriculture. By combining this data with information from the soils staff, they determined the depth of plowing needed at each depth of sand to at least partially restore soil productivity. The data was then correlated with price estimates from local contractors for deep plowing or sand removal work in order to give people an idea of the great expense and effort that lay ahead.²⁹¹ Finally, the public affairs staff made this data widely available to the public.²⁹²

The 1993 flood presented SCS soils experts with other vexing problems. Besides the problem of the amount of sand was its varying texture and strata. Bruce Thompson, state soil scientist, pointed out that the two peaks of the flood left two distinct layers in many places. The first flooding in June and July was relatively minor. The water generally moved slower and thus was able to move only smaller particles of sand onto farmland. These particles could be plowed into the soil with relative ease. The second high water in August and September was more devastating. It blew out many levees. The faster moving, more forceful water carried heavier sand particles which were placed on top of the first layer, thus creating a "sandwich" of coarse sand or gravel, fine sand, and finally soil. This phenomena was especially prevalent near major ruptures in levee systems. Staff at the state and local level stressed that farmers were eager to get information on restoring soil fertility as quickly as possible in order to reserve the special heavy plowing equipment that many would require.

²⁹⁰ "Farmers Eye Post-Flood Season," AP newswire, September 13, 1993.

²⁹¹ The price data came from an agricultural extension engineer at the University of Missouri.

²⁹² Missouri's sand and levees problems were the focus of a front-page article in the *New York Times* on June 9, 1994. The newspaper also used SCS's maps.



As flood water went down, parts of the Midwest looked like a desert. Here, SCS employee Bruce Thompson walks across sand deposited by flood waters in Missouri. Photo by Charles Rahm, SCS-Missouri.

An article in September's *Farm Journal* discussed various soil problems due to the flooding. One major problem was that the water broke down the soil structure and made it very susceptible to compaction by farm equipment. Sometimes, the silt cut off air from the soil, thus retarding biological activity--the fallow syndrome. Water also washed nitrogen out of the soil. Cover crops were vital for protecting the soil and restoring its fertility. The article stressed that farmers must be patient and let their fields drain as much as possible before moving equipment onto them.²⁹³ Allen Green, assistant state conservationist in Missouri, stated that it would cost at least \$300 million to reclaim sand-covered land. Restoring the land to its previous fertility level would require an additional \$81 million.²⁹⁴

Explaining the EWP program, levee policies, and sand deposits required a cooperative approach with other federal agencies, state government, and SCS national headquarters. For example, in early October, SCS, ASCS, and Corps personnel participated in a series

²⁹³ Darrell Smith, "When the Water Goes Down," *Farm Journal* (September 1993): 16-17.

²⁹⁴ Bill Graham, "Smothered Land Covers the Future," *Kansas City Star*, October 10, 1993.

of meetings in nine locations across Missouri in order to answer questions from the public, press, and politicians.²⁹⁵ SCS also exchanged information with state agencies, especially the Department of Natural Resources and the Department of Agriculture. In October, SCS and the University Extension from the University of Missouri and Lincoln University cooperated to produce a fact sheet which helped farmers assess the costs and difficulties of reclaiming their farmland. It included detailed information developed by SCS on incorporating sand into the soil in order to restore fertility.

State staff kept those in Washington informed of obstacles and progress in repair work, a task that involves both reporting statistical data and trying to draw attention to the unique needs of each their state. In late October of 1993, Russ Mills, state conservationist for Missouri, along with deputy director of the Missouri Department of Agriculture, Kyle Vickers, a wetlands specialist from the Missouri Department of Conservation, Steve Young, and a farmer from Ray County, Bob Vandiver, held a National Headquarters Seminar for USDA employees. Vandiver's farm, in the Missouri Valley Drainage and Levee District, was damaged due to a thirty-nine hundred-foot levee breach. These men focused on the vast problems associated with sand deposits in the Missouri River floodplain. The high velocity of the water in this flood picked up and spread relatively heavy materials far from the river, especially in areas downstream from bridges, which tended to constrict and speed the flow of water. The water then spread out across the floodplain, slowed, and deposited sand or gravel. Mills estimated that it could cost up to \$4,000 to remove one foot of sand from one acre of farmland. He and Vandiver stressed the need to provide clear policies on wetlands and levee repairs quickly so that farmers could make their decisions on next year's planting.

Missouri landowners were eager to participate in the EWRP program.²⁹⁶ This state had the highest number of sign-ups and acres enrolled. As was the case in Iowa, SCS worked closely with the state government. The Department of Conservation offered to provide an additional \$200 to \$300 per acre in order to purchase title to the land after SCS had obtained the easement. Thus, landowners could free themselves from any tax obligation for the land. Both the Fish and Wildlife Service and the Nature Conservancy sought to participate.

The scope, severity, and longevity of this disaster were unprecedented. Within that context, two problems plagued SCS's EWP effort in Missouri. First, more than in other flood states, continued heavy rains and slowly receding water hampered damage evaluations and repair work in the fall of 1993. A related issue was the lack of a clear policy from Washington on wetlands and levee repairs. Time and again, staff at the state

²⁹⁵ The meetings were organized by the state extension service.

²⁹⁶ See the wetlands section of this history for statistics on the 1993 and 1994 EWRP sign-ups.

and local level emphasized that farmers wanted concrete information on alternatives to structural repairs or cropland restoration. For example, those involved with the pilot WRP program in Missouri stressed that farmers had shown a great deal of interest in the 1992 program and were even more eager to participate in the wake of the flood. The problem was not simply in gathering technical or field data, although high water delayed this task, but also in obtaining overall guidance on policies.

Wisconsin and Minnesota

Although their agricultural output was devastated by the disaster of 1993, Wisconsin and Minnesota were the states with the smallest EWP efforts. These two states highlight the limits of the emergency program.

The experience of Wisconsin illustrates the long-term nature of this flood event. For farmers, this disaster began with the cool and wet weather in September of 1992. The ground was saturated even before the torrential rains of the spring and summer of 1993. Most damage was in the southwest part of the state. The Badger State suffered approximately \$800 million in agriculture-related damages due to the flood.²⁹⁷ According to the Service in Wisconsin, over eight hundred thousand acres of agricultural land (seven percent of the state total) suffered erosion of over ten tons per acre due to the extended rains on saturated soils which led to the flooding of the main rivers. It was expected to cost \$10.8 million to implement the land treatment practices necessary to protect the remaining topsoil and restore productivity to the land. Further, the floods delayed the construction of conservation measures required to meet the conservation compliance provisions of the Food Security Act. Nevertheless, Wisconsin SCS-ers reported that conservation practices already in place, such as contour strip cropping and conservation tillage, reduced the amount of soil washed away by up to five hundred percent.²⁹⁸

On July 18, a particularly severe hydrologic event occurred in the Baraboo area.²⁹⁹ By late August, a special field office had been established in Baraboo to service EWP sites. SCS worked with FEMA, local officials, and the Wisconsin Department of Natural Resources to facilitate repair work. At that time, fourteen damage sites were feasible for EWP (that is, they were feasible from an engineering and economic point of view).³⁰⁰ By mid-1994, it became clear that Wisconsin would have one of the smallest EWP efforts--the state office handled only twenty-three requests for assistance. Of the eighteen requests which were eligible for the emergency program, eight were for debris

²⁹⁷ For a detailed account of this state's experience with the floods, see Gary Heinrichs, ed., *The Floods of 1993: The Wisconsin Experience* (Bureau of Water Regulation and Zoning, Wisconsin Department of Natural Resources, 1994).

²⁹⁸ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #8, July 12, 1993.

²⁹⁹ Baraboo is both a town and a tributary to the Wisconsin River situated to the north of Madison.

³⁰⁰ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #36, August 30, 1993.

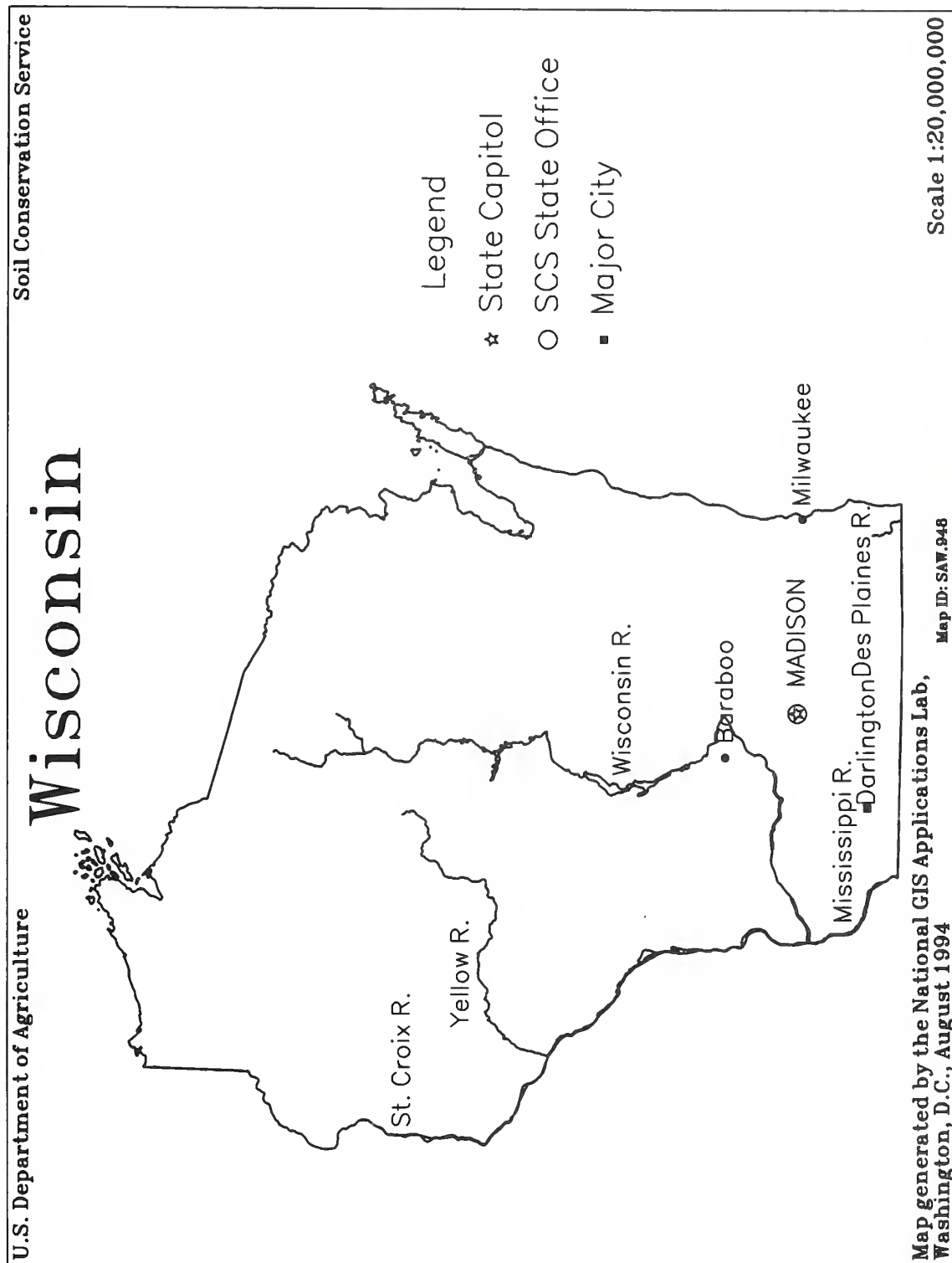


SCS promotes crop residue management in order to limit erosion and run-off of agricultural chemicals and fertilizers. A Minnesota farmer plants in the previous year's corn residue. He is also applying fertilizer and herbicide. SCS photo file.

removal and ten for erosion control. In Wisconsin, the Corps did a few levee repairs; SCS did none. As was the case in many of the nine states, the National Guard assisted in the immediate aftermath of the flood by removing debris and opening channels.

Primarily in response to the damages in the Baraboo area, the Service in Wisconsin participated in a variety of inter-agency flood response efforts. On July 30 the Disaster Response Group for Wisconsin met. The group included SCS, FEMA, ASCS, FmHA, the Wisconsin Agricultural Statistical Service, the Department of Trade and Consumer Protection, and the University of Wisconsin Extension. The Service also cooperated with the Corps to produce a flood mitigation plan for Darlington, a town in the southwest part of the state, through the Small Watershed Program.³⁰¹

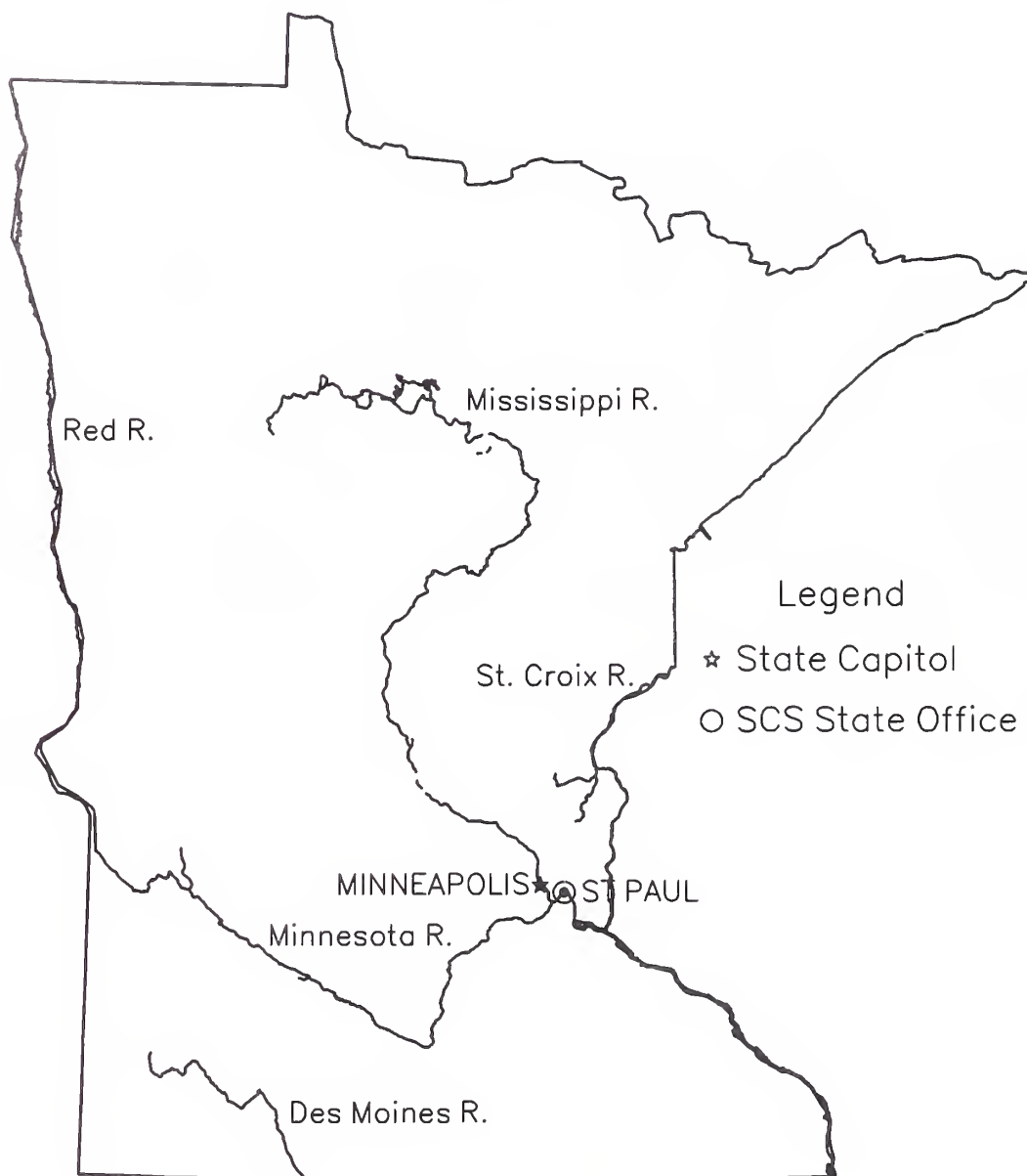
³⁰¹ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #16, July 22, 1993.



U.S. Department of Agriculture

Soil Conservation Service

Minnesota



Map generated by the National GIS Applications Lab,
Washington, D.C., August 1994

Map ID: SAW.943

Scale 1:20,000,000

The heavy rains of May marked the start of the great flood of 1993 in Minnesota.³⁰² For the next four months, the state would be hit by major storms. In Minnesota, some farmers had their crops washed out by heavy rains three times by early July.³⁰³ The most severe damage was in the southwestern part of the state. Due to storms in late July, however, the damage area expanded into the south-central part of the state.³⁰⁴ A total of fifty-seven counties were included in President Clinton's disaster declaration. As was the case in Wisconsin, agriculture was devastated in the state: corn production plummeted fifty-six percent in 1993.

The Soil Conservation Service played an important role in coordinating flood recovery work in Minnesota. On July 13, 1993, FEMA held a meeting with SCS and other agencies in order to prepare to respond to the flood. SCS staff chaired the Erosion-Sediment/Agriculture sub-group of the Minnesota Flood Recovery Team. The group included ASCS, FmHA, the Minnesota Board of Water and Soil Resources, the Minnesota Department of Agriculture, and congressional staff. Their goal was to route requests for assistance quickly.³⁰⁵ The Service in Minnesota received thirty-two requests for assistance after the flood. Of these, sixteen were eligible for the EWP program; thirteen for debris removal from streams and three for erosion control. The total estimated cost for repair contracts was less than one million dollars.

"Flood damage" meant much more than the popular image of raging waters flowing through the floodplain. Furthermore, reducing the reliance upon structures such as levees and removing the human presence from the floodplain will not make the problems and costs of flooding or excess rainfall disappear. A report by the Wisconsin Department of Natural Resource is worth quoting at length:

Perhaps the most misunderstood and least publicized factor in the 1993 floods was antecedent soil moisture....[M]ost media coverage focused on the riverine flooding, flash flooding, dam breaks and levee failures....Raging river, clogged dams, flooded homes and floating cars are more interesting than soil moisture levels, soil type analysis, soil depth to bedrock, and soil drainage patterns.

³⁰² For more information, see *The Great Flood of 1993: The Minnesota Experience*, a report prepared by the Minnesota Department of Public Safety, Division of Emergency Management.

³⁰³ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #4, July 6, 1993.

³⁰⁴ Karl F. Otte, Acting Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #26, August 5, 1993.

³⁰⁵ Lloyd E. Wright, Director, Watershed Projects Division, to Leonard P. Mandrgoc, USDA Emergency Coordinator, Office of the Assistant Secretary for Administration, Report #40, September 20, 1993.

In areas such as the pothole lakes region of Waushara County, the Fox/Wolf River/Lake Winnebago basin area, and the lower Wisconsin River Valley, high ground water tables and high antecedent soil moisture levels combined to create the majority of the flooding problems. It is imperative that people understand the differences between riverine and ground water flooding, especially the concept that floodplain management programs will not solve all types of flooding problems.³⁰⁶

Although SCS provided technical assistance to many landowners in order to help them address soil moisture and related problems, the EWP program itself was not designed to assist individuals with restoring the productivity of their cropland. This sort of damage may be covered by crop insurance, if the landowner purchased it. Alternatively, the farmer could be eligible for disaster relief payments and may participate in the Emergency Conservation Program funded by ASCS with SCS technical assistance.

³⁰⁶ Heinrichs, ed., *The Floods of 1993*, 6.

Conclusion

Reviewing the last year of travel, interviews, and research, I am impressed by the volume of recovery work done, the dedication of the SCS employees involved in the Emergency Watershed Protection effort, and the resilience of those directly affected by the flood. Most of the EWP work was performed, without fanfare, in rural communities which depended heavily upon commercial agriculture for their economic well-being. These projects, along with less frequent, but still important assistance to more urbanized areas, helped the people of the Midwest get back into their homes, businesses, and fields.

Flood recovery was also tied to routine SCS conservation efforts. Much of the damage in 1993 was due to saturated cropland, not inundation. Damage on individual farms was usually not eligible for EWP assistance. Farmers had to rely upon other Department of Agriculture programs, their own resources, and regular SCS technical assistance to restore the productivity of their land. In the long-run, the day-to-day conservation work with landowners which makes up the bulk of the Service's work may turn out to be among the most important facets of flood recovery.

At the same time, the Service participated in several initiatives which, if done on a large enough scale, could result in major long-term changes in the floodplains. The Emergency Wetlands Reserve Program and an environmental easement program may significantly reduce the human presence or at least the amount of expensive infrastructure or frequently flooded farmland in the floodplain. Experts from the Service also helped shape national policy through participation in the White House floodplain management committee and SAST data-collection efforts.

Using the flood of 1993 and the Service's recovery efforts to critique the Emergency Watershed Protection program is somewhat difficult due to the unprecedented size of the disaster and subsequent response. Clearly, EWP gains a great deal of local and Congressional support each time it is invoked. It also results in increased publicity for the Service and its other conservation efforts. The experience of 1993 was no exception, and, in fact, led to some of the most positive media attention for the Service's work in its history. These generally favorable evaluations must be understood in the context of the EWP program's ability to tackle tangible problems quickly. On the other hand, many of the persistent questions about the Service's dedication to wetlands or other environmental concerns remained in the background.

Investigations by experts in the Scientific Assessment and Strategy Team, data collected by SCS, and anecdotal evidence all suggest that the programs managed by the Service have made important contributions to the management of America's water resources, including flood control and prevention. This was most clear in projects built under the auspices of the Small Watershed Program. The combination of structural measures, such as small dams, and non-structural, like land treatment practices, reduced the local severity of flooding. In light of proposals to cut the Small Watershed Program in the FY 1995 budget, however, the future of these efforts appeared in doubt.³⁰⁷ Other activities, such as enforcement of the conservation compliance provisions of the 1985 and 1990 farm bills, also helped reduce sediment and slow run-off from fields. This was the sort of "normal" soil and water conservation work to which many SCS employees were eager to return.

The flood response also must be understood in its unique political and economic context. First, the new administration had not selected a Chief for SCS until early 1994, thus reducing the Service's leverage and bargaining power with other federal agencies. This did not help SCS in its discussions with ASCS over the emergency wetlands program. Second, the Re-inventing Government effort, while probably logical and cost-effective in the long run, did make some federal agencies less likely to cooperate with one another. Third, budget constraints and the drive by each agency to prove its worth to the incoming administration drove much of the flood recovery process, or at least the way in which that work was presented to policy makers in Washington.

The story of levee repair and floodplain management revealed a pattern of conflict between two informal coalitions. On one side were experts in the federal bureaucracy, academia, and environmental groups, who sought to create rational and consistent flood recovery and floodplain management policies. On the other side were forces such as farmers and landowners, SCS employees at the state level or below, and elected representatives. They focused on solving specific, concrete problems. The former tended to emphasize making major policy changes while the latter generally wanted to return to the pre-flood conditions. For example, time and again, the internally consistent, well-thought out plans for levee repair developed by SCS or the Corps were overridden by the democratic political process--Congress fulfilling the wishes its constituents.

³⁰⁷ Many of the Service's efforts to publicize the role of the Small Watershed Program's flood prevention or control effects by the national headquarters and the states must be understood in the context of this threat to long-term funding for the program.

Matching the interests of Washington with local goals proved difficult. The problem boiled down to this: what appeared to be an insignificant change from the national level translated into a major trauma for a single town, watershed, levee district, or individual farmer. A local community would fight hard to protect what it perceived to be in its interests--often by demanding an exception to a national policy, such as those developed for levee repair. Employees of the Service at times shared this disconnect with the national-level policy makers. For example, a district conservationist in a small town had intimate knowledge of the local situation, such as the importance of a small levee or system of drainage ditches, and was also subject to local pressure in order to get something repaired quickly. An area or state conservationist may have received pressure from the state or Congressional representatives intent on solving a specific problem in their district.

To a large extent, the relatively loose organizational structure of the Service functioned well in flood recovery work. SCS was able to attack the greatest problems in each state or region--whether it be levee repair, wetlands, debris removal, streambank stabilization, or channel clear-out. Although from a national level, the approaches and priorities of the nine states to flood recovery efforts may have appeared untidy and at times contradictory, on the ground, communities, conservation districts, and individuals--the taxpayers--got the assistance they needed.

Appendix A

Frequently Used Acronyms

Agricultural Stabilization and Conservation Service	ASCS
Area Conservationist	AC
Bureau of Indian Affairs	BIA
Cable News Network	CNN
Computer Aided Design	CAD
Conservation Reserve Program	CRP
Cooperative Extension Service	CES
Damage Survey Report	DSR
Department of Housing and Urban Development	HUD
Disaster Field Office	DFO
District Conservationist	DC
Economic Development Administration	EDA
Economics and Social Sciences Division (SCS)	ECN
Emergency Conservation Program	ECP
Emergency Watershed Protection	EWP
Emergency Wetlands Reserve Program	EWPR
Engineering Division (SCS)	ENG
Environmental Defense Fund	EDF
Environmental Protection Agency	EPA
Extension Service	ES
Farmer's Home Administration	FmHA
Federal Emergency Management Administration	FEMA
Fish and Wildlife Service	FWS
Food Safety and Inspection Service	FSIS
Food Security Act	FSA
Memorandum of Understanding	MOU
Midwest National Technical Center	MNTC
National Agricultural Library	NAL
National Headquarters (SCS)	NHQ
National Oceanic and Atmospheric Administration	NOAA
National Park Service	NPS
National Weather Service	NWS
Office of the Inspector General	OIG
Office of Management and Budget	OMB
Resource Conservation and Development	RC&D

Rural Development Administration	RDA
Resources Inventory and Geographic Information System Division	RIGIS
Scientific Assessment and Strategy Team	SAST
Small Business Administration	SBA
Soil Conservation Service	SCS
Tree Assistance Program	TAP
U. S. Army Corps of Engineers	COE
U. S. Department of Agriculture	USDA
U. S. Geological Survey	USGS
U. S. Government Printing Office	GPO
Watershed Projects Division	WPD
Water Science and Technology Board	WSTB
Wetlands Reserve Program	WRP

Appendix B

Assistance from SCS Personnel

The following is a list of SCS personnel who were interviewed or provided other important information to assist in the preparation of this history.

Martin W. Adkins	EWP Coordinator	Iowa
David Anderson	Assistant State Conservationist	Mississippi
Lyle Asell	Assistant State Conservationist	Iowa
James E. Ayen	State Resource Conservationist	Iowa
Larry Babich	Liaison for the West and Midwest	WPD
Robert E. Ball	State Resources Information Manager	Missouri
Gene P. Barickman	Biologist	Illinois
Terry Barney	Natural Resources Data Base Manager	Missouri
Robert Bartles	Midwest Flood Recovery Coordinator	MTNC
Lynn A. Betts	Information Officer	Iowa
Dennis F. Beyer	Design Engineer	Illinois
George Bluhm	Midwest Flood Coordinator	WPD
Ross B. Braun	Water Resources Planning Specialist	Missouri
Arthur A. Bryant	Supervisory Contract Specialist	Iowa
Don Butz	Program Manager	Land Treat.
Timothy Christian	Public Affairs Specialist	Kansas
Charles E. Cobb	Deputy State Conservationist	Wisconsin
J. Reese Coulter	Area Engineer	Missouri
Earl E. Evans	Civil Engineer	Illinois
James L. Evans	Assistant State Conservation Engineer	Illinois
Paul G. Goldsmith	District Conservationist	Iowa
Pat Graham	Biologist	Missouri
Allen Green	Assistant State Conservationist	Missouri
Laura E. Greiner	Water Quality Information Specialist	Iowa
Douglas Helms	National Historian	ECN
Leroy Holtsclaw	Assistant State Conservationist	South Dakota
George T. Huey	State Administrative Officer	Illinois
Keith Hunt	Contract Specialist	Iowa
Mervin Ice	National Construction Engineer	ENG
Mark J. Jensen	State Conservation Engineer	Iowa
Kay Kitchen-Maran	Public Affairs Specialist	Illinois
Norm A. Klopfenstein	State Information Officer	Missouri
Jack D. Langford	Civil Engineer	Iowa
Glenn Lawson	GIS Specialist	RIGIS

Brian Lehman	Civil Engineering Technician	Iowa
William Lewis, Jr.	Agricultural Economist	Illinois
Ione Lyne	Secretary	WPD
Richard P. Macho	Area Conservationist	Illinois
Pat McGrane	Public Affairs Specialist	Nebraska
Mary Ann McQuinn	Public Affairs Specialists	Pub. Aff.
Harry N. Means	State Conservation Engineer	Illinois
Paige E. Mitchell	Public Affairs Specialist	Illinois
Thomas J. O'Conner	Rural Development Forester	Iowa
Karl Otte	Assistant Director	WPD
Gary N. Parker	Assistant State Conservationist	Illinois
John Peterson	Assistant Chief for the Midwest	NHQ
Cordes L. Potter	Civil Engineer	Missouri
Lane Price	National GIS Applications Leader	RIGIS
Charles E. Rahm	Public Affairs Specialist	Missouri
James Reel	WRPS Leader	Iowa
Edward G. Riekert	Director	WPD
Richard A. Rogers	Archaeologist	Iowa
David F. Rohlf	Assistant State Con. Engineer	Iowa
Roger G. Schnoor	Civil Engineer	Iowa
Harry S. Slawter	Assistant State Conservationist	Illinois
Janice A. Stanton	Administrative Services Officer	Illinois
Linda Stoltz	Contract Specialist	Ohio
Bruce Thompson	State Soil Scientist	Missouri
Marge Theurer	Program Manager	WPD
Kenneth D. Vogt	Assistant State Soil Scientist	Missouri
James Wallace	State Conservation Engineer	Kansas
Thomas Wehri	Assistant Director	WPD
Michael D. Wells	Assistant State Conservationist	Missouri
Wes Wiedenmeyer	State Conservation Engineer	North Dakota
Stacey Wood	GIS Specialist	RIGIS

Appendix C

Photography Credits

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The charts and graphs were prepared by J. D. Ross of SCS's Economics and Social Sciences Division.

Versacad diagrams were prepared by Brian Lehman, Civil Engineering Technician in Iowa.

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